# SAF-RC-031 100-F Burial Grounds Remaining Sites Soil Quick Turn FINAL VALIDATION PACKAGE

# COMPLETE COPY OF VALIDATION PACKAGE TO:

Jeanette Duncan (3) H9-02

MINITAL/DATE

SDG (K0080)

SAF-RC-031

Waste Site: 100-F-38 AND 128-F-2



Date:

12 January 2006

To:

Washington Closure Hanford Inc. (technical representative)

From:

TechLaw, Inc.

Project:

100F Area Burial Grounds Remaining Sites - Soil -Waste Sites 100-F-38

& 128-F-2

Subject: Semivolatile - Data Package No. K0080

### INTRODUCTION

This memo presents the results of data validation on Data Package No. K0080 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

	//Semiole Dena	The All Well of Service	Social resultations	
J10FT0	11/2/05	Soil	С	See note 1 & 2
J10FT1	11/2/05	Soil	C	See note 1 & 2
J10FT2	11/2/05	Soil	С	See note 1 & 2

<sup>1 -</sup> Semivolatiles by 8270C.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and Sampling and Analysis Plan for the 100 Area Remaining Sites (DOE/RL-99-58, Rev. 0, September 2000). Appendices 1 through 5 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation

#### DATA QUALITY OBJECTIVES

## Holding Times

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two

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<sup>2 -</sup> Waste site 100-F-38.

times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were met.

#### Method Blanks

Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the CRQL and is less than five times (or less than ten times for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected "U".

Due to method blank contamination, the di-n-butylphthalate results in all samples were qualified as undetected, raised to the RQL and flagged "U".

Due to method blank contamination, the bis(2-ethylhexyl)phthalate results in all samples were qualified as undetected and flagged "U".

All other method blank results were acceptable.

#### Field Blanks

No field blanks were submitted for analysis.

# · Accuracy

# Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J".

Undetected sample results with spike recoveries below control limits are qualified as estimates and flagged "UJ". Undetected sample results are not qualified if the spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

Due to an LCS recovery outside QC limits (49%), all 4-nitroanaline results were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits (38%), all carbazole results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

# Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If two surrogates of the same class of compounds (base/neutral or acid) are out of control limits, all associated sample results greater than the contract required quantitation limit (CRQL) are qualified as estimates and flagged "J". Sample results less than the CRQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the CRQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

All surrogate results were acceptable.

#### Precision

## Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of +/-30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

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Due to an RPD outside QC limits, all bis(2-chloroethyl)ether (53%), 2,4-dinitrophenol (62%) and 3,3-dichlorobenzidine (42%) results were qualified as estimates and flagged "J".

All other precision results were acceptable.

# Field Duplicate Samples

No field duplicates were submitted for analysis.

# Analytical Detection Levels

Reported analytical detection levels are compared against the required quantitation limits (RQL's) to ensure that laboratory detection levels meet the required criteria. All undetected analytes exceeded the RQL. Under the WCH statement of work, no qualification is required. All other analytes met the RQL.

## · Completeness

Data package No. K0080 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

# **MAJOR DEFICIENCIES**

None found.

### MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to method blank contamination, the di-n-butylphthalate results in all samples were qualified as undetected, raised to the RQL and flagged "U".
- Due to method blank contamination, the bis(2-ethylhexyl)phthalate results in all samples were qualified as undetected and flagged "U".
- Due to an LCS recovery outside QC limits (49%), all 4-nitroanaline results were qualified as estimates and flagged "J".

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- Due to an LCS recovery outside QC limits (38%), all carbazole results were qualified as estimates and flagged "J".
- Due to an RPD outside QC limits, all bis(2-chloroethyl)ether (53%), 2,4-dinitrophenol (62%) and 3,3-dichlorobenzidine (42%) results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

All undetected analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

#### REFERENCES

WCH, Contract #20266, Validation Statement of Work, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-96-22, Rev. 4, 100 Area Remedial Action Sampling and Analysis Plan, U.S. Department of Energy, February 2005.

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# Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the BHI validation SOW are as follows:

- Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the same quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- R Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ Indicates presumptive evidence of a compound at an estimated value.

  The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N Indicates presumptive evidence of a compound. The data may not be valid for some specific applications usable for decision-making purposes).

Appendix 2
Summary of Data Qualification

# SEMIVOLATILE DATA QUALIFICATION SUMMARY\*

SDG KOOSOU STORY TO THE	TRIEVIEWERTE NULLE	Project ADDIT-3867	PAGE 1865 I
COMMENTS:			17.50
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Di-n-butylphthalate	U at RQL	All	Blank contamination
Bis(2-ethylhexyl)phthalate	U	All	Blank contamination
4-nitroanaline Carbozole	J	All	LCS recovery
Bis(2-choroethyl)ether 2,4-dinitrophenol 3,3-dichlorobenzidine	J	ALL	RPD

<sup>\* -</sup> The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

# Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

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Project: WASHINGTON CLOSU	JRE H	ANFORD		)										
Laboratory: LLI	SDG:	K0080				<u> </u>								
Sample Number		J10FT0		J10FT1		J10FT2	Ш.			Sample Number		J10FT0	J10FT1	J10FT2
Waste Site		100-F-38		100-F-38		100-F-38				Waste Site		100-F-38	100-F-38	100-F-38
Remarks										Remarks				
Sample Date		11/2/05		11/2/05		11/2/05				Sample Date		11/2/05	11/2/05	11/2/05
Extraction Date		11/7/05		11/7/05		11/7/05	<u> </u>			Extraction Date		11/7/05	11/7/05	11/7/05
Analysis Date		11/9/05		11/9/05		11/10/05				Analysis Date		11/9/05	11/9/05	11/10/05
Semivolatile (8270C)			Q		Q	Result Q	Res	sult		Semivolatile (8270C)		Result Q	Result Q	Result Q
Phenol	300	350		350		340 U				Acenaphthene	300	350 U	350 ∪	350 U
bis(2-Chloroethyl)ether	300	350		350	ŲJ	340 UJ				2,4-Dinitrophenol	300	880 UJ	880 DJ	840 UJ
2-Chlorophenol	300	350	U	350	υ	340 U				4-Nitrophenol	300	880 U	880 U	840 U
1,3-Dichlorobenzene	300	350	Ü	350	υ	340 U				Dibenzofuran	300	350 U	350 U	340 U
1,4-Dichlorobenzene	300	350	U	350	J	340 U	$\top$			2,4-Dinitrotoluene	300	350 U	350 U	340 U
1,2-Dichlorobenzene	300	350	Ū	350	Ü	340 U				Diethylphthalate	300	350 U	350 U	340 U
2-Methylphenol	300	350	U	350	U	340 U	T			4-Chlorophenyl-phenyl ether	300	350 U	350 U	340 U
2,2'-oxybis(1-chloropropane)	300	350	Ū	350	U	340 U	1			Fluorene	300	350 U	350 U	340 U
4-Methylphenol	300	350		350	Ü	340 U	1			4-Nitroaniline	300	880 UJ	880 UJ	840 UJ
N-Nitroso-di-n-propylamine	300	350		350		340 U				4,6-Dinitro-2-methylphenol	300	880 U	880 U	840 U
Hexachioroethane	300	350	_	350		340 U	1			N-Nitrosodiphenylamine	300	350 U	350 U	340 U
Nitrobenzene	300	350	U	350	U	340 U	1			4-Bromophenyl-phenyl ether	300	350 U	350 U	340 U
Isophorone	300	350		350		340 U	1			Hexachlorobenzene	300	350 U	350 U	340 U
2-Nitrophenol	300	350		350		340 U				Pentachiorophenol	300	880 U	880 U	840 U
2.4-Dimethylphenol	300	350		350	U	340 U				Phenanthrene	300	350 U	350 U	340 U
bis(2-Chloroethoxy)methane	300	350	U	350	Ü	340 U				Anthracene	300	350 U	350 Ü	340 U
2,4-Dichlorophenoi	300	350		350		340 U	1			Carbazole	300	350 UJ	350 UJ	340 UJ
1,2,4-Trichlorobenzene	300	350		350		340 U	1			Di-n-butylphthalate	300	300 U	300 U	300 U
Naphthalene	300	350		350	Ū	340 U	1			Fluoranthene	300	350 U	350 U	340 U
4-Chioroaniline	300	350	_	350		340 U				Pyrene	300	350 U	350 U	340 U
Hexachlorobutadiene	300	350		350		340 U	T			Butylbenzylphthalate	300	350 U	350 U	340 U
4-Chloro-3-methylphenol	300	350		350		340 U	<del>                                     </del>		T	3,3'-Dichlorobenzidine	300	350 UJ	350 UJ	340 UJ
2-Methylnaphthalene	300	350		350	_	340 U	<b>†</b>			Benzo(a)anthracene	300	350 U	350 U	340 U
Hexachlorocyclopentadiene	300	350		350		340 U	$T^-$			Chrysene	300	350 U	350 U	340 U
2,4,6-Trichlorophenol	300	350		350	_	340 U	1			bis(2-Ethylhexyl)phthalate	300	510 U	450 U	400 U
2.4.5-Trichlorophenol	300	880		880		840 U			_	Di-n-octylphthalate	300	350 U	350 U	340 U
2-Chloronaphthalene	300	350		350		340 U	+-		<del>                                     </del>	Benzo(b)fluoranthene	300	350 U	350 U	340 U
2-Nitroaniline	300	880		880		840 U	+			Benzo(k)fluoranthene	300	350 U	350 U	340 U
Dimethylphthalate	300	350		350		340 U	+		┢┈	Benzo(a)pyrene	300	350 U	350 U	340 U
Acenaphthylene	300	350		350		340 U	+		<del>                                     </del>	Indeno(1,2,3-cd)pyrene	300	350 U	350 U	340 U
2.6-Dinitrotoluene	300	350		350		340 U	+-		<del> </del>	Dibenz(a,h)anthracene	300	350 U	350 U	340 U
3-Nitroaniline	300	880		880		840 U	+		$\vdash$	Benzo(g,h,i)perylene	300	350 U	350 U	340 U

Semivolatiles by GC/MS, HSL List Report Date: 11/11/05 16:54

RFW Batch Number: 0511L633		Client:					0080 0080	Work Order: 11343606001					Page: 1a		
	Cust ID:	J10FT	)	J1	OFTO		J10FT	0	J10FT	L	J10FT2	2	SBLKQA		
Sample	RFW#:	00:	L	00	l MS		001 MS	D	002	2	003	3	05LE0870	-MB1	
Information	Matrix:	SOIL		S	OIL		SOIL		SOIL		SOIL		SOI	L	
	D.F.:	1.0	00		1.00		1.0	00	1.0	00	1.0	00	1	.00	
	Units:	ug/l	ζg	. 1	ug/Kg		ug/i	Kg	ug/I	ζg	ug/I	(g	ug	/Kg	
	Nitrobenzene-d5	88	*		74	k	89	*	65	<u> </u>	64	<u></u> ት	62	*	
Surrogate	2-Fluorobiphenyl	94	*	•	74	È	80	¥	67	*	68	ŧ	60		
Recovery	Terphenyl-d14	97	¥	1	81 4	ŧ	. 88	¥	80	욯	78	윰	78		
-	Phenol-d5	90.	*		74	ŧ	85	¥	67	8	68	*	67		
	2-Fluorophenol	74	ŧ	(	52 5	t	79	*	60	*	58	윻	62	*	
	2,4,6-Tribromophenol	95	ę.			È.	93	*	69	ફ	74	*	71	*	
Phenol	======================================	350				} } :==:	======: 93	≖≕£l=: %	*= <b>==</b> =================================	:=fl==: U	340	=fl= U	33		
	ethyl)ether	350	UJ	' .		È	124	¥	350	o ブ	340	ប្រ	_		
2-Chloropheno	1		ū	. (		·	89	ş.	350	Ü	340	ע	- 33		
1.3-Dichlorob	enzene	350	U		54 5	Ì.	85	ક	350	Ü	340	Ū	330		
-1,4-Dichlorob	enzene	350	Ų	. (	51 5	<b>k</b> .	79	*	350	ט	340	Ü	33(		
~1,2-Dichlorob	oenzene	350	σ	(	56 5	ł	85	*	350	ប	340	Ü	331		
2-Methylpheno		350	U	•	79 9	È	92	ક	350	U	340	U	330		
2,2'-oxybis(1	-Chloropropane)	350	U	•	73 \$	š	93	ŧ	350	U	340	บ	330		
-Methylpheno	01	350	U		31 9	<b>t</b>	94	옿	350	U	340	Ū	330		
N-Nitroso-di-	n-propylamine	350	U		31 9	k .	100	*	350	σ	340	Ū	330	0 U	
Hexachloroeth	iane	350	U		59 8	t	80	*	350	U	340	บ	330	0 U	
		350	U	•	74 9	š	95	Ł	350	U	340	Ū	330	0 υ	
Isophorone		350	Ũ	8	32 9	<b>k</b>	102	*	350	ប	340	U	330	0 П	
2-Nitrophenol	·	350	U		75 9	ł	93	*	350	U	340	Ü	330	0 U	
2,4-Dimethylp	henol	350	U		77 9	k .	85	*	350	Ū	340	Ū	330	0 U	
bis(2-Chloroe	thoxy) methane	350	U	•	73 9	<b>š</b>	91	*	350	U	340	Ū	330	U 0	
2,4-Dichlorop	ohenol	350	U	7	76 9	ţ	88	뫔	350	U	340	Ū	330	0 Π	
1,2,4-Trichlo	probenzene	350	U		វិ5 វ	Ś	83	ક્ષ	350	U	340	U	330	ט ס	
Naphthalene		350	U	<b>£</b>	59 1	š	85	*	350	Ų	340	U	33(		
4-Chloroanili	ne	350	U	10	7 1	•	129	፡ *	350	Ū	340	U	330	υ. 0	
Hexachlorobut	adiene	350	U	6	i8 1	\$	86	*	350	σ	340	U	330	0 Π	
4-Chloro-3-me	thylphenol	350	U	E	35 ,	\$	97	*	350	U	340	U	330		
2-Methylnapht	halene	350	U	7	75 1	វ	89	*	350	U	340	U	330		
Hexachlorocyc	:lopentadiene	350	U	4	4 1	š	58	ક	350	U	340	U	330		
2,4,6-Trichlo	rophenol	350	U	7	71	\$	81	Ł	350	U	340	U	330		
2,4,5-Trichlo		880	Ū	. 8	30 9	<b>š</b>	93	f	880	U	840	U	830		
*= Outside of	EPA CLP QC limits.			-							1 - las				

Mr 1/12/06

Cust ID:	J10FT0	J10FT		J10FT		J10FT1	J10FT2	Page: 1b	
RГИ#:	001	001 MS	3	001. MSI	<b>D</b>	002	003	05LE0870-M	
2-Chloronaphthalene	350 Ŭ	73	*	85	8	350 U	340 U	330	
2-Nitroaniline	880 U	94	¥	109	ቴ	880 U	840 U	830	
Dimethylphthalate	350 U	78	¥	89	*	350 U	340 U	330	
Acenaphthylene	350 U	74	¥	90	8	350 U	340 U	- 330	
Acenaphthylene2,6-Dinitrotoluene	350 U	86	ક્ષ	101	웋	350 U	340 U	330	
3-Nitroaniline	880 Ū	109	*	133	ક્ષ	880 U	840 U	830	
Acenaphthene	350 U	73	ક્ષ	87	ક	350 U	340 U	330	
2,4-Dinitrophenol	880 U <b>J</b>	34	ક	65	*	880 UJ	840 U	3 830	
4-Nitrophenol	880 U	95	왐	110	¥	880 U	840 U	830	
4-Nitrophenol Dibenzofuran	350 U	· 77	욯	90	ક	350 U	340 U	330	
2.4-Dinitrotoluene	350 U	91	욯	108	ક્ષ	350 U	340 U	330	
2,4-Dinitrotoluene Diethylphthalate	350 U	78	8	90	*	350 U	340 U	330	
4-Chlorophenyl-phenylether	350 U	71	윻	83	*	350 Ü	340 U	330	
Fluorene	350 U	77	욯	90	Ł	350 U	340 U	330	
4-Nitroaniline	880 UJ	95	ક્ષ	123 '	* *	880 U T	840 U	37 830	
4,6-Dinitro-2-methylphenol	880 U	75	¥	92	¥	880 Ū	840 U	830	
N-Nitrosodiphenylamine (1)	350 U	- 66	ક	78 <sup>-</sup>	*	350 U	340 U	330	
4-Bromophenyl-phenylether	350 ปี	70	윰	82	윻	350 U	340 U	330	
Hexachlorobenzene	350 U	77	* `	90	¥	350 U	340 U	330	
Hexachlorobenzene Pentachlorophenol	880 U	98	ŧ	115	¥	880 Ü	840 U	830	
Phenanthrene	350 U	74	ક્ર	87	욯	350 U	340 U	330	
Anthracene	350 U	82	욯	95	*	350 U	340 U	330	
Carbazole	350 UJ	93	윻	109	윻	350 UJ	340 U	I 330	
Di-n-butylphthalate	300 47 JUNB U	82	ક્ષ	93	8	300 36 JUL 1	30 0 20 JE	JO 22	
Pluoranthene	ິ 350 <b>ໍ້</b> ປ	84	*	96	ક	ั 350ี่ "บ	340 U	330	
Pyrene	350 U	77	*	89	ક્ષ	350 U	340 U	· 330	
Butylbenzylphthalate	350 U	77	ક	94	*	350 U	340 U	330	
3,3'-Dichlorobenzidine	350 UJ	65	*	100	*	350 UJ	340 U	J 330	
Benzo(a) anthracene	350 U	79	¥	91	ક	350 U	340 U	330	
Chrysene	350 U	78	옿	90	ક	350 Ų	340 U	330	
bis(2-Ethylhexyl)phthalate	510 🕱 U	71	용	88	ક્ર	450 \$ U 350 \$	400 年	250 330	
Di-n-octyl phthalate	350 제간	90	*	109	*	350 <sup>2/6</sup>	340 0	330	
Benzo(b) fluoranthene	. 350 Ū .	77	*	98	¥	350 U	340 U	330	
Benzo(k) fluoranthene	350 U	87	*	102	*	350 U	340 U	330	
Benzo (a) pyrene	350 U	78	¥	91	*	· 350 U	340 U	330	
Indeno(1,2,3-cd)pyrene	350 U	60	*	74	*	350 U	340 U	330	
Dibenz(a,h)anthracene	350 U	62	¥	77	<b>%</b>	350 U	340 U	330	
Benzo(g,h,i)perylene	350 U	52	<b>%</b>	66	*	350 U	340 U	330	

p 1/12/02

Report Date: 11/11/05 16:54

Semivolatiles by GC/MS, HSL List

Client: TNUHANFORD RC-031 K0080 Page: 2a RFW Batch Number: 05111633 Work Order: 11343606001 Cust ID: SBLKOA BS SBLKQA BSD 05LE0870-MB1 Sample RFW#: 05LE0870-MB1 SOIL SOIL Information Matrix: D.F.: 1.00 1.00 Units: ug/Kg ug/Kg 70 Nitrobenzene-d5 71 2-Fluorobiphenvl 75 ş 76 Surrogate Terphenyl-d14 72 81 Recovery Phenol-d5 77 77 74 74 2-Fluorophenol 2,4,6-Tribromophenol 85 96 ==f1=======f1=====f1=======f1======f1=======f180 ¥ 82 Phenol bis(2-Chloroethyl)ether ¥ 81 78 Ł 83 2-Chlorophenol 1,3-Dichlorobenzene 76 \* 76 \_ 1,4-Dichlorobenzene 73 75 1,2-Dichlorobenzene 78 80 2-Methylphenol 81 2,2'-oxybis(1-Chloropropane) 78 81 4-Methylphenol 79 83 N-Nitroso-di-n-propylamine 85 82 73 75 Hexachloroethane 73 Nitrobenzene 83 85 Isophorone 74 80 2-Nitrophenol 2,4-Dimethylphenol 65 66 73 75 bis (2-Chloroethoxy) methane\_\_\_\_ 1/12/06 75 73 2,4-Dichlorophenol 71 1,2,4-Trichlorobenzene 70 73 Naphthalene 89 92 4-Chloroaniline Hexachlorobutadiene 76 76 82 4-Chloro-3-methylphenol 81 78 2-Methylnaphthalene Hexachlorocyclopentadiene\_ 61 57 2,4,6-Trichlorophenol 80 82 2,4,5-Trichlorophenol 83 92

\*= Outside of EPA CLP QC limits.

			·····				
	2-Chloronaphthalene		_ 78	*	81	8	
	2-Nitroaniline Dimethylphthalate		. 85	*	89	*	
	Dimethylphthalate		_ 85	*	91	*	
	Acenaphthylene		80	*		*	,
	2,6-Dinitrotoluene		_ 87	욯	95	ક	
	J-Nitroaniline		_ 88	¥	98	ક	
	Acenaphthene		_ 83	¥	84	£	
	Acenaphthene 2,4-Dinitrophenol		_ 37	ł	70	*	
	4-Nitrophenol		_ 80	웋	85	*	
	Dibenzofuran		_ 82	*	86	ક	
	2,4-Dinitrotoluene		_ 94	¥	104	f	
	Diethylphthalate_ 4-Chlorophenyl-phenylether_		83	¥	92	8	
	4-Chlorophenyl-phenylether_		82		84	*	
	Fluorene		_ 82		88	8	
	4-Nitroaniline		49'	* *	53	ક	
	4,6-Dinitro-2-methylphenol_N-Nitrosodiphenylamine (1)_		92	¥	138	*	
ı	N-Nitrosodiphenylamine (1)		70	8	80	*	
	4-Bromophenyl-phenylether		77	*	88	ક	
	Hexachlorobenzene		89	ŧ	100	웋	
	Pentachlorophenol		88	¥	122	*	•
	Phenanthrene			*	94	ક	
	Anthracene		90	ş	100	ક	
	Carbazole		38	· %	47	· &	
	Carbazole Di-n-butylphthalate		98	ક્ષ	112	f	
	Fluoranthene		94	ક	109	¥	
	Pyrene		75	*	85	물	
	PyreneButylbenzylphthalate		91	¥	104	₹	
	3,3'-Dichlorobenzidine		81	¥		*	
	Benzo(a) anthracene	-	84	锋	95	¥	1/12/01
	Chrysene			*	94	8	1/2/00
	bis(2-Ethylhexyl)phthalate_				110	f	
	Di-n-octyl phthalate	<del></del>	97		120	*	· t
	Benzo(b) fluoranthene		82		99	*	
	Benzo(k) fluoranthene				92	ž	
	Benzo(a)pyrene		81			ę.	
	Indeno(1,2,3-cd)pyrene					ě	
	Dibenz (a, h) anthracene	<del></del>	79	ş	82	ž.	
	Benzo(g,h,i)perylene			ş.	80	ę.	

# Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation



### Case Narrative

Client: TNU-HANFORD RC-031

LVL#: 0511L633

SDG/SAF # K0080/RC-031

W.O. #: 11343-606-001-9999-00 Date Received: 11-04-2005

## **SEMIVOLATILE**

Three (3) soil samples were collected on 11-02-2005.

The samples and their associated QC samples were extracted according to Lionville Laboratory SOPs based on SW 846 method 3540C on 11-07-2005 and analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 11-08,09,10-2005.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

- 1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
- 2. Samples were extracted and analyzed within required holding time.
- 3. Non-target compounds were detected in the samples.
- 4. All surrogate recoveries were within acceptance criteria.
- 5. Two (2) of one hundred twenty-eight (128) matrix spike recoveries were outside acceptance criteria.
  - Three (3) of one hundred twenty-eight (128) blank spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
- 6. The method blank contained the common laboratory contaminants Bis (2-Ethylhexyl) phthalate and Di-n-butylphthalate at levels less than the CRQL.
- 7. Internal standard area and retention time criteria were met.
- 8. Manual integrations are performed according to SOP QA-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").
- 9. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.
- 10. I certify, that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data, contained in this hard-copy data package, has been authorized, by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels

Laboratory Manager

Lionville Laboratory Incorporated

som/gorup/data/bna/tnu-hanford/0511-633.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 1 8 pages.

Lionville Laboratory S	sample Discrepancy Report (	SDR) SDR #: 05M5345
Initiator: Shann Saylor Date: 11-10.05	Batch: <u>05N L 633</u> Samples: <u>85+850</u>	Parameter: <u>\$170</u> Matrix: <u>Solio</u>
Client: Thu	Method: SW846/MCAWW/CLP/	Prep Batch: <u>051E0870</u>
Reason for SDR     a. COC Discrepancy Tech Profit	le Error Client Request Sar on Error Wrong Test Code Oth	mpler Error on C-O-C
b. General Discrepancy Missing Sample/Extract Hold Time Exceeded Improper Bottle Type Note: Verified by [Log-In] or [Prep Group] (class)	ontainer Broken Wrong Sam sufficient Sample Preservation of Amenable to Analysis	•
c. Problem (include all relevant spec	•	
, '	I analytes in the blank spik	a + blankspikedup but
	e + matrixspike dyp are ok	
2. Known or Probable Causes(a)		
loss duri	ny extraction	
3. Discussion and Proposed Action Re-log Entire Batch Following Samples: Re-leach Re-extract Re-digest Revise EDD Change Test Code to Place On/Take Off Hold (circle)	namate  - Odla C	
4. Project Manager Instructionssign  Concur with Proposed Action Disagree with Proposed Action; S Include in Case Narrative Client Contacted: Date/Person Add Cancel	See Instruction	(10)
5. Final Actionsignature/date:		ion:
When Final Action has been recorde	ed, forward original to QA Specialist for d	listribution and filing.
Route Distribution of Completed SDF  X Initiator  X Lab General Manager M.  X Project Mgr: Stone/Johnson  Data Management Stilwell  Sample Prep: Beegle/Kiger		ic: Perrone Kiger chiak Daley

QA-105-A-0805

Washington Close	ure Hanford	C	HAIN OF CUS	TODY/S	SAMPL	E ANAL	YSIS F	REQUES	T	R	C-031-008	Page i	ુ જા ક
Collector COFFMAN			Dany Contact F Coffman	Telepho 528-6			P	roject Coord ESSNER, JH	izator	Price Code		Data T	n.lusto
Project Designation 100-F Burial Grounds Rem	zining Sites - Soil Quick		ling Location DF/100-F-38					SAF No. RC-031		Air Quality [		15	DA
Ice Chest No. ER	4-01-040	Field EF	Legbook No. L-1174		COA R126F22	000	M	lethod of Shi FED X	punen t				
Skipped To EBERLINE SERVICES 1	IONVILLE	Offici	e Property No.	10601	104		В	ill of Lading	/Air Bill	Ņo. ⊃	ee 0	يور 	
POSSIBLE SAMPLE HAZ	ARDS/REMARKS		Preservation	None	None	· Cool 4C	Cool 4C	Coel 4C	None				T
	<b>.</b>		Type of Container	. #G	яG	æG	æG	10	P				十
Special Handling and/or Cool 4 deg. C	Storage		No. of Container(s)	1	1	1	1	I	1		1	<del></del>	$\uparrow$
			Volume	60mL	60m2,	60mL	60mil,	60mL	1000m	ı.	<del>                                     </del>		<del>                                     </del>
	Sample anai	.YSIS		See Rem (1) in Special Instructions	ICP Metalt - 6010A (Add- on) (Assistony, Beryllium, Nickel, Thellium)	Clawmum Hex - 7196	PCBe - 8082	Soni-VOA - 8276A (TCL)	See item (2 Spicial Instruction CAST	<b>5</b>			
Sample No.	Matrix *	Sample Date	Sample Time			STANK S							73 P
J10FT0	SOIL ·	11/2/0		X	X	X	X	X	X			ENTER	
J10FT1	SOIL	11/2/05		Χ_	X	У	K	X	X			Sour	业
J10FT2	SOIL	11/2/03	1300	<u> </u>	<u> </u>	χ.	X	_ X	<u> </u>	<b></b>		Noen	4_
								<del> </del>		1		<u> </u>	十
Religguished By/Removed From	Date/Time /600	Received By/Sten	od in Day  A 372 8  and in Day  and in Day  and in Day  and in Day  and in Day	te/Time	2) NA (1) IX Cadm Nicke (2) G	ium, Calcium, ( I, Potavaium, S amum Spectros	10 (Client Lin Chromium, C elenium, Silic scopy (TCL L	() (Ahuminum, / obsit, Copper, I on, Silver, Sodi int) (Cenium-13	ron, Lead, um, Vazud 7, Cobali-	Arsenic, Barlurn, Magnesium, Mar lium, Zine); Men 60, Europium-15 ramium-235, Uva	iganese, Molybd oury - 7470 - (C 2, Buropum-154	crum, V)	Mai \$-\$cit \$6-\$c \$0-\$c \$1-\$b \$1-\$b \$1-\$b \$1-\$b \$1-\$b \$1-\$b \$1-\$b \$1-\$b \$1-\$b \$1-\$b \$1-\$b \$1-\$b \$1-\$c \$1-
Relinquished By/Removed From Relinquished By/Removed From	Date/Time	Received By/Stor	Miss Da		<del>D</del> C ·		· :			·			W -W 1-Lie V-Ve X-09
LABORATORY Received B				Tid	le l	<u> </u>	<del></del>		<del></del>	· 	· D	ate/Time	<u> </u>
FINAL SAMPLE Disposel M DISPOSITION	lettod	<del></del>	······································	····	·	Dispo	ecd By	<del> </del>		<u>.</u>	1	ete/Time	

# Appendix 5

**Data Validation Supporting Documentation** 

# GC/MS ORGANIC DATA VALIDATION CHECKLIST

PROJECT:	VALIDATION LEVEL:	A	В	(c)	D		E _
SN-846 8260  SW-846 8260  SW-846 8260  SW-846 8260  SW-846 8270  (TCLP)  SAMPLES/MATRIX  TIOFTO TIOFTI TIUT?  1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE  Technical verification documentation present?  Comments:  2. INSTRUMENT TUNING AND CALIBRATION (Levels D and E)  GC/MS tuning/performance check acceptable?  Continuing calibrations acceptable?  Continuing calibrations acceptable?  Yes No Standards traceable?  Yes No Standards traceable?  Yes No Standards traceable?  Yes No Standards expired?	PROJECT:	100-F	-38	DATA PACKAG	E: K008	. O.	
ANALYSES PERFORMET  SW-846 8260 SW-846 8270 SW-846 8270  (TCLP)  SAMPLES/MATRIX  TIOFTO TIOFTI TIUT?  1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE  Technical verification documentation present? Yes No 12  Comments:  2. INSTRUMENT TUNING AND CALIBRATION (Levels D and E)  GC/MS tuning/performance check acceptable? Yes No 12  Continuing calibrations acceptable? Yes No 15  Standards traceable? Yes No 15  Standards traceable? Yes No 15  Standards expired? Yes No 15  Calculation check acceptable? Yes No 15	VALIDATOR:	TLF	LAB:		DATE: 1/	9/04	
SW-846 8260  SW-846 8260  SW-846 8270  SW-84				SDG:	10080		
SAMPLES/MATRIX  TIOFTO JIOFTI JIOH?  I. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE  Technical verification documentation present?  Comments:  Ves No 1  Comments:  Ves No 1  Continuing/performance check acceptable?  Initial calibrations acceptable?  Continuing calibrations acceptable?  Standards traceable?  Ves No 1  Standards traceable?  Ves No 1  Standards expired?  Ves No 1  Calculation check acceptable?  Ves No 1			ANALYSES	PERFORMED			-
TIOFTO JIOFTI JIUH?  501  I. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE  Fechnical verification documentation present? Yes No No No Comments:  2. INSTRUMENT TUNING AND CALIBRATION (Levels D and E)  GC/MS tuning/performance check acceptable? Yes No No No Continuing calibrations acceptable? Yes No No No Standards traceable? Yes No No Standards expired? Yes No No Calculation check acceptable? Yes No No No Calculation check acceptable? Yes No No Calculation check acceptable? Yes No	SW-846 8260			SW-846 8270		•	
TIOFTO JIOFTI JIUH?  501  I. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE  Fechnical verification documentation present? Yes No No No Comments:  2. INSTRUMENT TUNING AND CALIBRATION (Levels D and E)  GC/MS tuning/performance check acceptable? Yes No No No Continuing calibrations acceptable? Yes No No No Standards traceable? Yes No No Standards expired? Yes No No Calculation check acceptable? Yes No No No Calculation check acceptable? Yes No No Calculation check acceptable? Yes No		<u> </u>					
DATA PACKAGE COMPLETENESS AND CASE NARRATIVE  Technical verification documentation present? Yes No No No Note that the continuing calibrations acceptable? Yes No No Note that the continuing calibrations acceptable? Yes No Note that the continuing calibration check acceptable? Yes No Note that the continuing calibration check acceptable? Yes No Note that the continuing calibration check acceptable? Yes No Note that the continuing calibration check acceptable? Yes No Note that the continuing calibration check acceptable? Yes No Note that the continuing calibration check acceptable? Yes No Note that the continuing calibration check acceptable? Yes No Note that the continuing calibration check acceptable? Yes No Note that the continuing calibration check acceptable? Yes No Note that the continuing calibration check acceptable? Yes No Note that the continuing calibration check acceptable? Yes No Note that the continuing calibration check acceptable? Yes No Note that the continuing calibration check acceptable? Yes No Note that the continuing calibration check acceptable? Yes No Note that the continuing calibration check acceptable? Yes No Note that the continuing calibration check acceptable? Yes No Note that the continuing calibration check acceptable?	SAMPLES/MAT	RIX					
I. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE  Technical verification documentation present? Yes No Note that the complete section of the complete s	TIOFT	0 310	FT1 J	INAS			
DATA PACKAGE COMPLETENESS AND CASE NARRATIVE  Technical verification documentation present? Yes No No Normants:  INSTRUMENT TUNING AND CALIBRATION (Levels D and E)  GC/MS tuning/performance check acceptable? Yes nitial calibrations acceptable? Yes No No Normanial calibrations acceptable? Yes No No Standards traceable? Yes No No Standards expired? Yes No No No Normanial calibration check acceptable? Yes No Normanial calibration check acceptable?							
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I. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE  Technical verification documentation present? Yes No Note that the company of							
DATA PACKAGE COMPLETENESS AND CASE NARRATIVE  Technical verification documentation present? Yes No No Note that the comments:  INSTRUMENT TUNING AND CALIBRATION (Levels D and E)  GC/MS tuning/performance check acceptable? Yes not it allowed to acceptable? Yes No Note that the comments is standards traceable? Yes No Note that the comment is standards expired? Yes No Note that the comment is the						50,7	
Comments:  INSTRUMENT TUNING AND CALIBRATION (Levels D and E)  GC/MS tuning/performance check acceptable?  No initial calibrations acceptable?  Continuing calibrations acceptable?  Standards traceable?  Yes No in the continuing calibration of the continuing calibration acceptable?  Yes No in the continuing calibration acceptable?  Yes No in the continuing calibration of the continuing calibration acceptable?  Yes No in the continuing calibration acceptable?  Yes No in the continuing calibration check acceptable?		· · · · · · · · · · · · · · · · · · ·		·····	<del></del>	<del></del>	
GC/MS tuning/performance check acceptable?  Initial calibrations acceptable?  Continuing calibrations acceptable?  Standards traceable?  Yes No Mandards expired?	rechnical verificati	on documentation p	present?			Yes	(No) N/
GC/MS tuning/performance check acceptable?  Initial calibrations acceptable?  Continuing calibrations acceptable?  Standards traceable?  Yes No Mandards traceable?  Yes No Mandards expired?  Yes No Mandards expired?  Yes No Mandards calculation check acceptable?  Yes No Mandards expired?  Yes No Mandards expired?							<del></del>
GC/MS tuning/performance check acceptable?  Initial calibrations acceptable?  Continuing calibrations acceptable?  Standards traceable?  Yes No Mandards expired?					<del></del>		
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GC/MS tuning/performance check acceptable?  Initial calibrations acceptable?  Continuing calibrations acceptable?  Standards traceable?  Yes No Mandards traceable?  Yes No Mandards expired?  Yes No Mandards expired?  Yes No Mandards calculation check acceptable?  Yes No Mandards expired?  Yes No Mandards expired?	. INSTRUM	MENT TUNING A	ND CALIBRATIO	ON (Levels D and 1	E)		
nitial calibrations acceptable? Yes No 19 Continuing calibrations acceptable? Yes No 19 Standards traceable? Yes No 19 Calculation check acceptable?				•	-	Yes	No N
Standards traceable?							[ ]
Standards expired? Yes No	Continuing calibrat	ions acceptable?	• • • • • • • • • • • • • • • • • • • •	•••••••••	***************************************	Yes	No N/
Calculation check acceptable?	Standards traceable	?	***************************************		***************************************	Yes	No N/
, and the second	Standards expired?		•••••	•••••		Yes	No N/
Tomments:	Calculation check a	cceptable?	••••••			Yes	NO NA
Sommones.	Comments:			····		<del></del>	

# GC/MS ORGANIC DATA VALIDATION CHECKLIST

Calibration blanks analyzed? (Levels D, E)	
	Yes No N/A
Calibration blank results acceptable? (Levels D, E)	Yes No (N/)
Laboratory blanks analyzed?	Ye No N/A
Laboratory blank results acceptable?	Yes (No) N/A
Field/trip blanks analyzed? (Levels C, D, E)	Yes No N/
Field/trip blank results acceptable? (Levels C, D, E)	Yes No N
Transcription/calculation errors? (Levels D, E)	
Comments: d1-h-butylphotolete - Vat Rai	ho #8
4. ACCURACY (Levels C, D, and E)	
Surrogates/system monitoring compounds analyzed?	
Surrogate/system monitoring compound recoveries acceptable?	
Surrogates traceable? (Levels D, E)	Yes No (N4
Surrogates expired? (Levels D, E)	Yes No (V/A
MS/MSD samples analyzed?	Yes) No N/A
MS/MSD results acceptable?	Ye No N/A
MS/MSD standards NIST traceable? (Levels D, E)	Yes No N/2
MS/MSD standards? (Levels D, E)	Yes No 1
LCS/BSS samples analyzed?	
LCS/BSS results acceptable?	Yes (No) N/A
Standards traceable? (Levels D, E)	Yes No N/A
Standards expired? (Levels D, E)	Yes No W/
Transcription/calculation errors? (Levels D, E)	Yes No N/2
Performance audit sample(s) analyzed?	Yes (No) N/A
Performance audit sample results acceptable?	Yes No N/2
Comments: LCS 4-hitrococlin + corherals -	
	no PAS

# GC/MS ORGANIC DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)	
MS/MSD samples analyzed?	Yes No N/A
MS/MSD RPD values acceptable?	Yes (No N/A
MS/MSD standards NIST traceable? (Levels D, E)	Yes No (N/A
MS/MSD standards expired? (Levels D, E)	Yes No (N/A
Field duplicate RPD values acceptable?	Yes No NA
Field split RPD values acceptable?	Yes No N/A
Transcription/calculation errors? (Levels D, E)	Yes No (N/A
Comments: bis (2-chloro- ryl) -then	
3,4 dinitrophed MPD	Jall
3,3 dichlero henzioly	
6. SYSTEM PERFORMANCE (Levels D and E)	6
Internal standards analyzed?	j
Iinternal standard areas acceptable?	ı
Internal standard retention times acceptable?	,
Standards traceable?	Yes No N/A
Standards expired?	Yes No N/A
Transcription/calculation errors?	Yes No W/A
Comments:	
7. HOLDING TIMES (all levels )	6
Samples properly preserved?	( )
Sample holding times acceptable?	Yes No N/A
Comments:	
	·

# GC/MS ORGANIC DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LI	MITS (all		
levels)			
Compound identification acceptable? (Levels D, E)	Yes	No(	(N)
Compound quantitation acceptable? (Levels D, E)	Yes	No	MA
Results reported for all requested analyses?		No	N/A
Results supported in the raw data? (Levels D, E)	Yes	No	Q/A
Samples properly prepared? (Levels D, E)	Yes	No	
Laboratory properly identified and coded all TIC? (Levels D, E)	Yes	No(	NA
Detection limits meet RDL?	Yes (	(M)	N/A
Transcription/calculation errors? (Levels D, E)  Comments: all underes			<b>(1)</b>
			——
		_	
	<u> </u>		
	<del>,</del>		
9. SAMPLE CLEANUP (Levels D and E)			
GPC cleanup performed?	Yes	No	N/A
GPC check performed?	Yes	No	N/A
GPC check recoveries acceptable?	Yes	No	N/A
GPC calibration performed?	Yes	No	N/A
GPC calibration check performed?	Yes	No	N/A
GPC calibration check retention times acceptable?	Yes	No /	N/A
Check/calibration materials traceable?	Yes	No	N/A
Check/calibration materials Expired?	Yes	No	N/A
Analytical batch QC given similar cleanup?	Yes	No	N/A
Transcription/Calculation Errors?	Yes	No	N/A
Comments:		_ \	

Date:

12 January 2006

To:

Washington Closure Hanford (technical representative)

From:

TechLaw, Inc.

Project:

100F Area Burial Grounds Remaining Sites - Soil - Waste Sites 100-F-

38 & 128-F-2

Subject: PCB - Data Package No. K0080

# INTRODUCTION

This memo presents the results of data validation on Data Package No. K0080 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Semplesid :	ky Sejřijel (Deske)	ide i Weselie i Hag	NAVallidation	e de la Company
J10FT0	11/2/05	Soil	С	See note 1 & 2
J10FT1	11/2/05	Soil	C	See note 1 & 2
J10FT2	11/2/05	Soil	С	See note 1 & 2

<sup>1 -</sup> PCBs by 8082.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and Sampling and Analysis Plan for the 100 Area Remaining Sites (DOE/RL-99-58, Rev. 0, September 2000). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers

Appendix 2. Summary of Data Qualification

Appendix 3. Qualified Data Summary and Annotated Laboratory Reports

Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation

Appendix 5. Data Validation Supporting Documentation

#### DATA QUALITY OBJECTIVES

## Holding Times

Sample data were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded by less than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for nondetects. If holding times are exceeded by greater than two times the limit, all

<sup>2 -</sup> Waste site 100-F-38.

associated detected sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

#### · Method Blank

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or analysis. At least one method blank analysis must be conducted for every 20 samples. Method blanks should not contain target compounds at a concentration greater than required quantitation limit (RQL). If target compounds are present, sample results less than five times the blank concentration are qualified as undetected and flagged "U". If the sample result is less than five times the blank concentration and less than RQL, the result is qualified as undetected and elevated to the RQL.

All method blank results were acceptable.

## Field Blanks

No field blanks were submitted for analysis.

#### Accuracy

# Matrix Spike & Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Non-detected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

All accuracy results were acceptable.

## Surrogate Recovery

The analysis of surrogate compounds provides a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows

have been established by the laboratory. When a surrogate compound recovery is outside the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Non-detected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Non-detected compounds with surrogate recoveries above the upper control limit require no qualification.

All surrogate results were acceptable.

#### Precision

# Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed as the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. For soil samples, results must be within RPD limits of plus/minus 30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All precision results were acceptable.

## Field Duplicate Samples

No field duplicates were submitted for analysis.

# · Analytical Detection Levels

Reported analytical detection levels are compared against the Remaining Waste Sites RQLs to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

## Completeness

Data Package No. K0080 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

## **MAJOR DEFICIENCIES**

None found.

## MINOR DEFICIENCIES

None found.

# **REFERENCES**

WCH, Contract #20266, Validation Statement of Work, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-99-58, Rev. 0, Sampling and Analysis Plan for the 100 Area Remaining Sites, September 2000.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the procedures herein are as follows:

- Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- R Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2
Summary of Data Qualification

# PCB DATA QUALIFICATION SUMMARY\*

SDG: K0080	REVIEWER: TLI	PROJECT: 100-F-38	PAGE_1_OF_1			
COMMENTS: No qualifiers assigned						

<sup>\* -</sup> The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

# Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

# PESTICIDE/PCB ANALYSIS, SOIL MATRIX, (UG/KG)

Page	1	αf	1	
ug-		_ ''_	_ '	

Project: WASHINGTON CL	7							
Laboratory: LLI	SDG: K0080							
Sample Number	J10FT0		J10FT1		J10FT2			
Waste Site	100-F-38		100-F-38		100-F-38			
Remarks								
Sample Date		11/2/05		11/2/05		11/2/05_		
Extraction Date	Extraction Date			11/8/05		11/8/05		
Analysis Date	Analysis Date			11/10/05	11/10/05		11/10/05	
PCB	RQL	Result	œ	Result	Q	Result	Q	
Arocior-1016	100	14	U	14	U	14	U	
Arocior-1221	100	14	U.	14	U	14	U	
Arocior-1232	100	14	U	14	U	14	U	
Aroclor-1242	100	14	U	14	Ü	14	U	
Aroclor-1248	100	14	Ü	14	Ü	14	U	
Arocior-1254	100	14	U	14	U	14	U	
Aroclor-1260	100	15		14	Ų	32		

# Lionville Laboratory, Inc.

PCBs by GC

Report Date: 11/17/05 13:39 . RFW Batch Number: 0511L633 Client: TNUHANFORD RC-031 K0080 Work Order: 11343606001 Page: 1

	Cust ID:	J10FT(	)	J10 <b>FT</b> 1	_	J10FT2	2	J10FT2	ł	J10FT2	2	<b>DBTKAM</b>	
Sample	RFW#:	003	ι	002	2	003	3	003 M	3	003 MSI	)	05LE0875-1	MB1
Information	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	D.F.:	1.0	00	1.0	0	1.0	00	1.0	00	1.0	00	1.0	00
•	Units:	UG/I	KG	UG/F	Œ	. UG/I	(G	UG/I	(G	UG/F	<b>KG</b>	UG/i	KG
Surrogate:	Tetrachloro-m-xylene	39	*	. 68	*	62	*	58	*	62	*	58	
	Decachlorobiphenyl	42	*	70	*	6 <del>9</del>	*	64	*	60	¥	64	옿
	*****		==fl==	*****	=fl==		=fl==	*=======	=fl==		==fl	=======================================	== <b>f</b>
Aroclor-1016		14	ซ	. 14	U	14	U	. 86	*	91	*	13	
Aroclor-1221		14	U	14	U	14	Ū	14	ט	14	Ū	13	σ
Aroclor-1232		14	U	14	Ū	14	U	14	Ū	14	. 0	13	Ū
Aroclor-1242		14	U	14	σ	14	U	14	ט	14		13	Ū
Aroclor-1248		14	Ū	14	ប	14	Ū	14	Ū	14	Ū	13	Ū
Aroclor-1254		14	Ū	14	ט	14	U	14	Ū	14	Ū	. 13	Ū
Aroclor-1260		15		14	υ	32		102	ę.	98	ě	13	Ū

Cust ID: PBLKVW BS

Sample Information	RFW#:	05LE0875-MB1
Information	Matrix:	SOIL
<u> </u>	D.F.:	1.00
7	Units:	UG/KG

f				:
Surrogate:	Tetrachloro-m-xylene	65	*	
•	Decachlorobiphenyl	69	*	
****			-=fl=	
Aroclor-101	6	111	*	
Aroclor-122	1	13	U	
Aroclor-123	2	13	ΰ	. 1/2-
Aroclor-124	2	13	U	
Aroclor-124	8	13	υ	1 1 1
Aroclor-125	4	13	U	1/12/01-
Aroclor-126	0	110	울	1/12/00

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked. %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. \*= Outside of EPA CLP QC

**Laboratory Narrative and Chain-of-Custody Documentation** 



#### Case Narrative

Client: TNU-HANFORD RC-031

LVL#: 0511L633

SDG/SAF # K0080/RC-031

W.O. #: 11343-606-001-9999-00 Date Received: 11-04-2005

## **PCB**

Three (3) soil samples were collected on 11-02-2005.

The samples and their associated QC samples were extracted on 11-08-2005 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 11-09,10,11-2005. The extraction procedure was based on method 3540C and the extracts were analyzed based on method 8082.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

- 1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
- 2. Samples were extracted and analyzed within required holding time.
- 3. The samples and their associated QC samples received Copper-Sulfur and Sulfuric Acid cleanups according to Lionville Laboratory SOPs based on SW846 methods 3660A and 3665A respectively.
- 4. The method blank was below the reporting limits for all target compounds.
- 5. All surrogate recoveries were within acceptance criteria.
- 6. The blank spike recoveries were within acceptance criteria.
- 7. All matrix spike recoveries were within acceptance criteria.
- 8. The initial calibrations associated with this data set were within acceptance criteria.
- 9. The continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
- 10. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.
- 11. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels

Laboratory Manager

Lionville Laboratory Incorporated

som\r:\group\data\pes\mu hanford\0511-633.pcbs

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 8 pages.

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Washingto	on Closure Hanfor	d (	CHAIN OF CUS	TODY/S	AMPL	E ANAL	YSIS	REQUES	T		RC-031-008	Page 1	of T
Collector COFFMAN			tineny Contact T Coffman	Telepho 528-6				Project Coord KESSNER, JH		Price Co	ode	Date Tu	Irmarou()
Project Designation 100-F Burial Gra	on ounds Remaining Sites - So		apline Location OO F / 100-P-38					SAF No. RC-031		Air Qu	ality 🗍	15	DA
ice Chest No.	ERL-01-1	940 Fiel	d Logbook No. PL-1174		COA R126F22	200		Method of Shi FED X	ptsent	· .			ର ଉଷ
	RVIDESTLIONVILLE		ilte Property No.	40601	04		-	Bill of Lading	/Air Biil L	No.	322 0	5°C	ග
POSSIBLE SAM	PLE HAZARDS/REMAR	IKS										T	
NA			Preservation	None	Nens	Cool 4C	Cool		None			<u> </u>	
Special Handlin	ig and/or Storage		Type of Container	#G	aG	aG	aG	#G	P	. l			<u>.                                    </u>
Cool 4 deg. C	g and or seeinge		No. of Centainer(s)	1	1	1	1	1	1				
			Velume	60anL	60ml.	60mL	60ml	. 60mL	1 000sr	L			
000014	SAMPLI	e analysis		See item (1) in Special Instructions.	ICP Metals - 6010A (Add- on) (Antimony, Boryllium, Nickel	Chromium Hex - 7196	PCBc - 4	982 Seri-VOA - 8270A (TCL)	See item ( Special Instruction	na.			
, <del>,    </del>					Thellium	<u> </u>			1117	·			
Sample N	o. Matrix <sup>4</sup>	Sample Date	Sample Time			E MARIE		图 经额	3000			1.44.4	
J10FT0	SOIL	11/2/2		<u> </u>	X	X	X	X	\X			CENTER	
J10FT1	soil	11/2/6	5 1245	<u> </u>	<u> </u>	X		<u> </u>	X.			Soun	<u>.</u>
J10FT2	SOIL	11/2/0	7 1300	<u> </u>	χ.	X	X	X	人			Noem	
CHAIN OF P. Relinquished By/Remov RT COFFMA1. Relinquished By/Remov 3725 Ref	ed from Date/Time  1/FT Cff ma  24 al3 of	1600 Received By/St 1/2/07 REPER Received By/St 1000 V	#2A 3728 med in Di	ate/Time 160  11/2/0  ate/Time	(1) IC Cadma Nicke (2) G	iam, Calcium, I, Potassium, S aanna Spectro	iO (Client Chromium elenium, S reopy (TC	List) (Ahmimun, A , Cobalt, Copper, I lifeon, Silver, Sodi L List) (Cesium-13	ron, Lead, sro, Vanse 7, Cobalt-	Maguerium ium, Zine): l 60, Europius	ium, Beryllium, Boro Manganese, Molyb Mercury - 7470 - (C m 152, Buropium 154	densm, (V)	Matrix *  5-2cil 25-5cilcond 30-4cild 31-6lodge W = Water 0-0t A-Air
clinguished By/Remov	ed From Date/Time	(36) Received By Bu	Med EX	sto/Time 05   05		ium-155); Gao	oma Spec	- Add-on (Americi	um-241, U	randum-235,	Uranium-238)		DS-Drum Solid DL-Drum Liqui T-Tiana 1Vj-Wipe L-Liquid V-Vapetation
Relinquished By/Remov	ed From Date/Time	Received By St	tred is Di	ate/Time									X-Other
Relinquished By/Remov	ed From Date/Time	Received By/St	ored in De	ate/Time								•	
LABORATORY SECTION	Received By			Tie	<del></del>					<del>-</del> -	[	late/Time	<del></del>
FINAL SAMPLE DISPOSITION	Disposal Method					Dispo	sed By					Date/Time	

**Data Validation Supporting Documentation** 

VALIDATION LEVEL:	Α	В	0	D	Е
PROJECT: /oc	138 131	F 2 1/9/9	DATA PACKAG	E: K0080	>
VALIDATOR:	TCT	LAB: LL7	_	DATE: 1/9	106
			SDG:	∞80	
		ANAL YSES I	PERFORMED		
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		
SAMPLES/MAT	RIX				
JIOF	TO J	OFTI	JIOFTZ		
	4				
	<u> </u>				
					Suil
Technical verificat	ACKAGE COMPI	present?		TE .	Yes (No) N/A
2. INSTRU	MENT PERFORM	IANCE AND CAL	IBRATIONS (Lev	els D and E)	
Initial calibrations	acceptable?	***************************************			Yes No N/A
•	· <b>=</b>				Yes No N/A
					1 1
-					Yes No N/A
	•				1 1
					\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \

3. BLANKS (Levels B, C, D, and E)	
Calibration blanks analyzed? (Levels D, E)	Yes No N/A
Calibration blank results acceptable? (Levels D, E)	Yes No N/A
Laboratory blanks analyzed?	Ye No N/A
Laboratory blank results acceptable?	
Field/trip blanks analyzed? (Levels C, D, E)	Yes No) N/A
Field/trip blank results acceptable? (Levels C, D, E)	Yes No N/A
Transcription/calculation errors? (Levels D, E)	Yes No (N/A)
Comments:	no FB
4. ACCURACY (Levels C, D, and E) Surrogates analyzed?	Yes No N/A
Surrogate recoveries acceptable?	
Surrogates traceable? (Levels D, E)	
Surrogates expired? (Levels D, E)	
MS/MSD samples analyzed?	
MS/MSD results acceptable?	<b>&gt;</b> ∞<
MS/MSD standards NIST traceable? (Levels D, E)	
MS/MSD standards expired? (Levels D, E)	Yes No N/A
LCS/BSS samples analyzed?	~ \ /
LCS/BSS results acceptable?	Yes No N/A
Standards traceable? (Levels D, E)	Yes No N/A
Standards expired? (Levels D, E)	Yes No N/A
Transcription/calculation errors? (Levels D, E)	Yes No N/A
Performance audit sample(s) analyzed?	Yes(No) N/A
Performance audit sample results acceptable?	Yes No N/A
Comments:	No PAS

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5.	PRECISION (Levels C, D, and E)	<b>A</b>		
Duplica	tte RPD values acceptable?	( Yes	No	N/A
Duplica	tte results acceptable?	Ye	No	N/A
MS/MS	D standards NIST traceable? (Levels D, E)	Yes	No(	N/A
MS/MS	D standards expired? (Levels D, E)	Yes	No	WA
Field du	plicate RPD values acceptable?	Yes	No	NA
	olit RPD values acceptable?			
Transcr	iption/calculation errors? (Levels D, E)	Yes	No	(N/A
	ents:			<u> </u>
6.	SYSTEM PERFORMANCE (Levels D and E)			~
Chroma	tographic performance acceptable?	Yes	No	MA
Positive	results resolved acceptably?	Yes	No	N/A
Comme	nts:			$\leq$
				<del></del>
7.	HOLDING TIMES (all levels)			
Samples	s properly preserved?	(Ye	No	N/A
Sample	holding times acceptable?	( Yes	No	N/A
Comme	nts:			
	· · · · · · · · · · · · · · · · · · ·			
-		, , , , , , , , , , , , , , , , , , , ,		

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIM	ITS (all		
levels)			
Compound identification acceptable? (Levels D, E)	Yes	No	(N/A
Compound quantitation acceptable? (Levels D, E)			$\sim$
Results reported for all requested analyses?	(Yes)	No	N/A
Results supported in the raw data? (Levels D, E)	Yes	No	(N/A
Samples properly prepared? (Levels D, E)	Yes	No	NW
Detection limits meet RDL?			
Transcription/calculation errors? (Levels D, E)	Yes	Ne	NA
Comments:			
			_
9. SAMPLE CLEANUP (Levels D and E)			
Fluoricil ® (or other absorbent) cleanup performed?			1
Lot check performed?	Yes	No	N/A
Check recoveries acceptable?	Yes	No	N/A
GPC cleanup performed?	Yes	No	N/A
GPC check performed?	Yes	No	N/A
GPC check recoveries acceptable?	Yes	No	N/A
GPC calibration performed?	Yes	No	N/A
GPC calibration check performed?	Yes	Νo	N/A
GPC calibration check retention times acceptable?	Yes	No	N/A
Check/calibration materials traceable?	Yes	Np	N/A
Check/calibration materials Expired?	Yes	No	N/A
Analytical batch QC given similar cleanup?	Yes	No	N/A
Transcription/Calculation Errors?	Yes	No	N/A
Comments:			$\subseteq$

Date:

12 January 2006

To:

Washington Closure Hanford Inc. (technical representative)

From:

TechLaw, Inc.

Project:

100F Area Burial Grounds Remaining Sites - Soil - Waste Sites 100-F-

38 & 128-F-2

Subject: Wet Chemistry - Data Package No. K0080

## INTRODUCTION

This memo presents the results of data validation on Data Package No. K0080 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Y Sermiler But	Wasing of Sandra	riyedingila 4630	W.Validation	Date: WA
J10FT0	11/2/05	Soil	C	See note 1 & 2
J10FT1	11/2/05	Soil	C	See note 1 & 2
J10FT2	11/2/05	Soil	C	See note 1 & 2
J10FR9	11/2/05	Soil	С	See note 1 & 3

- 1 Chromium VI by 7196A.
- 2 Waste site 100-F-38.
- 3 Waste site 128-F-2.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work, Sampling and Analysis Plan for the 100 Area Remaining Sites (DOE/RL-99-58, Rev. 0, September 2000) and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, Rev. 4, February 2005). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers

Appendix 2. Summary of Data Qualification

Appendix 3. Qualified Data Summary and Annotated Laboratory Reports

Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation

Appendix 5. Data Validation Supporting Documentation

Appendix 6. Additional Documentation Requested by Client

## DATA QUALITY PARAMETERS

## Holding Times

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 30 days for chromium VI.

If holding times are exceeded, but not by greater than two times the limit, all 000001

associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All other holding times were acceptable.

#### · Method Blanks

## Method Blanks

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. All blank results must fall below the contract required detection limit (CRQL) to be acceptable.

All method blank results were acceptable.

## Field (Equipment) Blank

No field blanks were submitted for analysis.

#### · Accuracy

### Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J".

Finally, for samples with a recovery greater than 130% and a sample result less than the IDL, no qualification is required.

All accuracy results were acceptable.

#### · Precision

## **Laboratory Duplicate Samples**

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

## Field Duplicate

No field duplicates were submitted for analysis.

## Analytical Detection Levels

Reported analytical detection levels are compared against the required quantitation limits (RQLs) to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

## Completeness

Data package K0080 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

#### **MAJOR DEFICIENCIES**

None found.

#### MINOR DEFICIENCIES

None found.

## REFERENCES

WCH, Contract #20266, Validation Statement of Work, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-96-22, Rev. 4, 100 Area Remedial Action Sampling and Analysis Plan, U.S. Department of Energy, February 2005.

DOE/RL-99-58, Rev. 0, Sampling and Analysis Plan for the 100 Area Remaining Sites, September 2000.

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with BHI validation SOW are as follows:

- Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- BJ Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.
- Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ Indicates presumptive evidence of a compound at an estimated value.

  The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2
Summary of Data Qualification

# WET CHEMISTRY DATA QUALIFICATION SUMMARY\*

SDG: K0080	REVIEWER: TLI	PROJECT: 100-F-38 128-F-2	PAGE_1_OF_1
COMMENTS: No qualifi	ers assigned		

<sup>\* -</sup> The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Qualified Data Summary and Annotated Laboratory Reports

Project: WASHING	TON CLOSU	RE HANFO	ORD			_			
Lab: LLI	SDG: K	0080			-			1	
Sample Number		J10FT0		J10FT1		J10FT2		J10FR9	
Waste Site		100-F-38		100-F-38		100-F-38		128-F-2	
Remarks	•								
Sample Date		11/2/05		11/2/05		11/2/05		11/2/05	
Wet Chemistry	RQL	Result	Q	Result	Q	Result	Q	Result	Q
Chromium VI	0.5	1,9		0.23		1.0		0.20	U

### Lionville Laboratory, Inc.

#### INORGANICS DATA SUMMARY REPORT 11/11/05

CLIENT: TNUHANFORD RC-031 K0080 WORK ORDER: 11343-606-001-9999-00

LVL LOT #1 0511L633

					REPORTING	DILUTION
Sample	SITE ID	analyte	result	UNITS	Limit	FACTOR
	2222424c464e464e2		*****			
-001	JIOFTO	* Solids	94.9	•	0.01	1.0
		Chromium VI	1.9	MG/KG	0.21	1.0
-002	J10FT1	% Solids	94.8	4	0.01	1.0
	•	Chromium VI	0.23	MG/KG	0.21	1.0
-003	J10FT2	% Solids	94.6	*	0.01	1.0
		Chromium VI	1.0	MG/KG	0.21	1.0
-004	J10FR9	* Solids	98.6	*	. 0.01	1.0
		Chromium VI	0.20 u	MG/KG	0.20	1.0

1/12/or

Laboratory Narrative and Chain-of-Custody Documentation



## **Analytical Report**

Client: TNU-HANFORD RC-031 K0080

LVL#: 0511L633

W.O.#: 11343-606-001-9999-00

Date Received: 11-04-05

#### INORGANIC NARRATIVE

1. This narrative covers the analyses of 4 soil samples.

2. The samples were prepared and analyzed in accordance with the methods checked on the attached glossary.

LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete list of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

- 3. Sample holding times as required by the method and/or contract were met.
- 4. The results presented in this report are derived from samples that met LvLl's sample acceptance policy.
- The method blank for Chromium VI was within the method criteria. 5.
- 6. The Laboratory Control Samples (LCS) for Chromium VI were within the laboratory control limits.
- 7. The matrix spike recovery for Soluble Chromium VI was within the 75-125% control limits however MS recovery for Insoluble Chromium VI was above the control limits at 127.1% that may be attributed to sample inhomogeneity.
- 8. The replicate analyses for Percent Solids and Chromium VI were within the 20% Relative Percent Difference (RPD) control limit.
- 9. Results for solid samples are reported on a dry weight basis.
- 10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Lionville Laboratory Incorporated

njp\i11-633

The results presented in this report relate to the analytical testing and conditions of the samples upon receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 12 pages.

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Washingto	on Closure Hanford		CHAI	OF CUS	TODY/S	SAMP	LE ANAL	YSIS	REQUES	ST	T	RC-	031-008	Page 1	of 1
Callector COFFMAN	·		mpany Co R T Coffma		Telepho 528-6				Project Coor KESSNER, J			Price Code		Data T	urnarouad
Project Designatio 100-F Burial Oro	n nunds Remaining Sites - Soil Quick		mpling Los 100 F / 100						SAF No. RC-031			Air Quality		15	DA
Ice Chest No.	ERC-01-040	Fle	ld Legbool FL-1174	k No.		COA R126F2	22000		Method of Sh FBD X	ipment	•			<u> </u>	\ 
	VKE8/LIONVILLE	Off	site Prope	rtv No.	1060	104			Bill of Ladin	e/Air B	ill N	io. 3년	ره م	PC	
POSSIBLE SAM	PLE HAZARDSÆMARKS	•								$\prod$	• -				
M			Pı	reservation	None	None	Cool 4C	Coal 4	C Cool 4C		loos	•			1
Special Handlin	g and/or Storage		Туре	of Container	D <sub>s</sub> .	p.G	ьG	aG	зG		P				
Cool 4 deg. C	<b>9</b>		No. o	f Container(s)	- 1	1	1	1	t	11	1	1 . 1	1		
_				Volume	60mL	60mL	60ml.	60uni	. 60mil.	100	OmiL.				
	Sample anai	Lysis	<b>.</b>		See hem (1) in Special Instructions	ICP Metals 6010A (As on) (Astirmon Beryllium Miclosi, Thallism	14- Hex - 7196	PCBs - 9	Seni-VOA - 8270A (TCL						
Sample N	o. Matrix*	Sample Dat	e	Sample Time	nord called Horselphini	(a) (a)		(注: ) (2.4) (注: / (注: /							
J10FT0	SOIL	(1/2/	25	1230	X	X	X	X	X	X				CENTER	
J10FT1	SOIL	11/2/	5	1245	X	X	X	X	X		K			Sout	4
J10FT2	SOIL	11/2/1	7	1300	X	X.	X	X	X_		2			Noen	
	·	,			1					1	$\neg$				
														· · · · · · · · · · · · · · · · · · ·	
CHAIN OF PO			at Names				ECIAL INSTR	UCTIO	NS			<u></u>			Matrix *
Relinquished By/Remove 3725 Ce f Relinquished By/Remove delinquished By/Remove Relinquished By/Remove Relinquished By/Remove Relinquished By/Remove		Received By/S Received By/S	tored in tored in tored in tored in	372 8 (5/0 EX Da Da () 1/-1/1	te/Time	(1) (2) (2) (3)	ICP Metals - 601 dmium, Calcium, C ckel, Potassium, Se Gamun Spectros	Chromium Henium, S Icopy (TC	, Cobult, Copper, ilicon, Silver, Soc L List) (Cesium-l	Iron, Le Burn, Va 137, Cob	ud, M madiu pult-60	rsenic, Barium, Ber (agnesista, Manga un, Zinc); Mercur (), Europium 152, E unium 235, Uranéu	nese, Molybdi y  - 7470 - (C: Suropium-154,	cipladin, //}	S-Gald SE-Gradienae SO-Galid SE-Gladge W = Water O-OH A-Ale DE-Orana daida OL-Deart Liqui T-Tiana Wi-Wips L-Japah X-Other
Relinquished By/Remov	ed From Date/Time	Received By/S	tored in	De	to/Time										
LABORATORY SECTION	Received By				Til	tle							D	ate/Time	
FINAL SAMPLE DISPOSITION	Disposal Method						Diapor	od By					D	uto/Time	

Washington Closu	re Hanford		HAIN OF CUST	TODY/S	SAMPLI	E ANAL	YSIS	RJ	EQUEST	-	RO	C-031-007	Page 1	of > 1
Collector COFFMAN			nany Contact T Coffman	Telepho 528-6			•		oiect Coordin: SSNER, JH	itor	Price Code		Data To	urnaround
Project Designation 100-F Burial Grounds Rema	ining Sites - Soil Quick		pling Location OF/126-F-2, Light sand	y ash materia	ai				F No. 2031		Air Qualit	у 🗆	15	DAYS
Jee Chent No.	26-01-040		Legbook No. L-1174		COA R126F220	000			thed of Shipm ED X	est				
Shipped To EBERLINE SERVICES / L	IONVILLE )	Offsi	te Property No.	10601	04	•		Bij	of Ladiag/A	ir Bill	No. Sec	0500	•	
POSSIBLE SAMPLE HAZ				\[ \tag{\tag{\tag{\tag{\tag{\tag{\tag{	T		$\prod$					]	T	1
M			Preservation	None	None	Coal 4C	Nom	•					<u> </u>	:
Special Handling and/or	Storage		Type of Container	#G	10	#G	P							
Cool 4 deg. C	•		No. of Container(s)	1	1	1 .	<u>l l'</u>							
			Volume	60m).	60mL	60mai.	1000	mL.						,
	sample anai	LYS <b>IS</b>		See Jern (1) in Special Instructions.	ICP Metals – 6010A (Add- on) {Anticaony, Baryllium, Nicion, Thallium)	Chromitus Hex - 7196	See item ( Special Instruction  A	ions.		•				
Sample No.	Matrix *	Sample Date	Sample Time	A PARTY OF THE PAR	TAN LIEBY	Signal B			Malaina 2	iff(e		200	are and	
J10FR9 ~	SOIL	11/2/01	1200	_X	X	X	X							
									7					
						<u> </u>								
				<u> </u>	<u> </u>									
·				<u>.                                    </u>		<u> </u>	<u> </u>	$_{ m II}$		•				
CHAIN OF POSSESSIO Relisquished By/Removed From PT-CoffMfg/PT/ Relinquished By/Removed From	Date/Time 1600  Date/Time  (1 3 0 5 100  Date/Time  (1 3 0 5 100  Date/Time  1 405  Date/Time	Received By/Sto	red in Da	the Time   1/2/L the Time   5	(1) K Cadm Nicke (2) G Europ	ium, Calcium, I, Potassium, S auum Spectro	10 (Client Chromium Selevium, S scopy (TC	List) n, Col Silicon IL Lis	udt, Copper, Iron a. Sälver, Sodium t) (Cenium-137, 1	, Lead, Vanad Cobalt-	Arsenic, Barturu, Magnesium, Man ium, Zine); Merc 60, Buropium-152 ranium-235, Uran	ganese, Molybó ary - 7470 - (C , Baropiano-154	lenum, V)	Marix <sup>6</sup> 3-Sail SD-Selfement SD-Schild SI-Sindge W - Water D-O2 AnAle Dis-Drum Liquids T-Tiome WI-Wige Letignid V-Vagetation X-Other
LABORATORY Received By				Tit	ie	<del></del>					<u> </u>		ale/Time	<u></u>
FINAL SAMPLE Disposal Mo	elbod	<u></u>		<del></del>		Dispo	sed By				· ·	E	ate/Time	· · · · · · · · · · · · · · · · · · ·

**Data Validation Supporting Documentation** 

LEVEL:	A	В	(c)	D	E
PROJECT:	28F2 10UF	38	DATA PACKAG	E: K009	ÇG
VALIDATOR:		LAB: LLJ		DATE: //	9/06
			SDG:	K0080	
		ANALYSES	PERFORMED		
Anions/IC	тос	тох	TPH-418.1	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride (	Chromium-VI	pН	NO <sub>3</sub> /NO <sub>2</sub>
Sulfate	TDS	TKN	Phosphate		
SAMPLES/MA	TRIX				
JIOF	to 310	FT1 7	IUFTZ	· · · · · · · · · · · · · · · · · · ·	
-					Sul
Technical verifica	PACKAGE COMPlation documentation			E	
Technical verification  Comments:  2. INSTRU  Initial calibration	ution documentation  JMENT PERFORM  s performed on all in	IANCE AND CAL	IBRATIONS (Lev	E els D and E)	Yes No N/A
Technical verification  Comments:  2. INSTRU  Initial calibration	ation documentation	ANCE AND CAL	IBRATIONS (Lev	E els D and E)	Yes No N/A
Technical verification Comments:  2. INSTRI Initial calibration Initial calibration ICV and CCV ch	JMENT PERFORM s performed on all in s acceptable?	IANCE AND CAL struments?	IBRATIONS (Lev	E els D and E)	Yes No N/A Yes No N/A Yes No N/A Yes No N/A
Technical verification Comments:  2. INSTRU Initial calibration Initial calibration ICV and CCV chilcy and CCV chilcy	JMENT PERFORM s performed on all in s acceptable?	ANCE AND CAL struments?	IBRATIONS (Lev	els D and E)	Yes No N/A
Comments:  2. INSTRU Initial calibration ICV and CCV ch ICV and CCV ch Standards traceab	JMENT PERFORM s performed on all in s acceptable? ecks performed on a	ANCE AND CAL struments?	IBRATIONS (Lev	E els D and E)	Yes No N/A
Comments:  2. INSTRU Initial calibration ICV and CCV ch ICV and CCV ch Standards traceab	JMENT PERFORM s performed on all in s acceptable? ecks performed on al	IANCE AND CAL struments?	IBRATIONS (Lev	els D and E)	Yes No N/A

3. BLANKS (Levels B, C, D, and E)	
ICB and CCB checks performed for all applicable analyses? (Levels D	, E) Yes No N/A
ICB and CCB results acceptable? (Levels D, E)	Yes No NA
Laboratory blanks analyzed?	
Laboratory blank results acceptable?	$\sim$
Field blanks analyzed? (Levels C, D, E)	
Field blank results acceptable? (Levels C, D, E)	( )
Transcription/calculation errors? (Levels D, E)	Yes No
Comments:	No FR
4. ACCURACY (Levels C, D, and E)	
Spike samples analyzed?	Ye No N/A
Spike recoveries acceptable?	
Sike standards NIST traceable? (Levels D, E)	Yes No (N/A
Spike standards expired? (Levels D, E)	Yes No 😿
LCS/BSS samples analyzed?	
LCS/BSS results acceptable?	(Yes) No N/A
Standards traceable? (Levels D, E)	Yes No (N/A
Standards expired? (Levels D, E)	Yes No N/A
Transcription/calculation errors? (Levels D, E)	Yes No N/A
Performance audit sample(s) analyzed?	Yes No) N/A
Performance audit sample results acceptable?	Yes No (N/A
Comments:	No 247

5.	PRECISION (Levels C, D, and E)			
Duplicate	te RPD values acceptable?	Yes)	No	N/A
Duplicate	te results acceptable?	(Yes)	No	N/A
MS/MSI	D standards NIST traceable? (Levels D, E)	. Yes	N6	N/A
	D standards expired? (Levels D, E)		•	
Field dup	plicate RPD values acceptable?	. Yes	Nd	N/A
	lit RPD values acceptable?		-	
	ption/calculation errors? (Levels D, E)			<i>_</i>
	nts:			
	HOLDING TIMES (all levels)	_		
Samples	properly preserved?	Yes	No	N/A
Sample h	holding times acceptable?	. Yes	No	N/A
Commen	nts:	$\mathcal{L}$		

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)	
Results reported for all requested analyses?	( Yes No N/A
Results supported in the raw data? (Levels D, E)	Yes No (N/)
Samples properly prepared? (Levels D, E)	Yes No 🐼
Detection limits meet RDL?	(Yes) No N/A
Detection limits meet RDL?  Transcription/calculation errors? (Levels D, E)	Yes No NXA
Comments:	

**Additional Documentation Requested by Client** 

#### Lionville Laboratory; Inc.

## INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/11/05

CLIENT: TNUHANFORD RC-031 K0080 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0511L633

					REPORTING	DILUTION
SAMPLE	SITE ID	ANALYTE	RESULT	units	LIMIT	FACTOR
		表 內 項 医 医 全 型 性 理 美 单 项 医 至 全 型 全 型 是 与 与 —	******	2000年末		**=====
BLANK10	05LVI078-MB1	Chromium VI	0.20 u	MG/KG	0.20	1.0

### Lionville Laboratory, Inc.

#### INORGANICS ACCURACY REPORT 11/11/05

CLIENT: TNUMANFORD RC-031 K0080 WORK ORDER: 11343-606-001-9999-00 LVL LOT #: 0511L633

			SPIKED	INITIAL	SPIKED		DILUTION
Sample	SITE ID	ANALYTE	Sample	RESULT	AMOUNT	*RECOV	PACTOR (SPK)
7232 <b>2</b> 32	****	·····································	£ 22 2 2 2 2	****	単非合う言葉	***	*****
-004	J10FR9	Soluble Chromium VI	3.9	0.20u	4.1	97.7	1.0
		Insoluble Chromium VI	1260	0.20u	992	127.1	100
BLANK10	05LV1078-MB1	Soluble Chromium VI	4.0	0.20u	4.0	100.8	1.0
		Insoluble Chromium VI	1250	0.20u	1110	112.5	100

### Lionville Laboratory, Inc.

#### INORGANICS PRECISION REPORT 11/11/05

CLIENT: TNUHANFORD RC-031 K0080

LVL LOT #: 0511L633

WORK ORDER: 11343-606-001-9999-00

			INITIAL			DILUTION
SAMPLE	SITE ID	ANALYTE	RESULT	REPLICATE	RPD	FACTOR (REP)
	<b>祖生民主胡雪及民主官主司司司宣书宣言之政</b>	#####################################	*****	*******	***	******
-001RBP	J10FT0	* Solids	94.9	95.3	0.44	1.0
-004REP	J10FR9	Chromium VI	0.20u	0.20u	NC	1.0

Date: 12 January 2006

To: Washington Closure Hanford Inc. (technical representative)

 $(a,b) = a^{-\frac{1}{2}} (a^{-\frac{1}{2}} a^{-\frac{1}{2}} a^{-\frac{1$ 

From: TechLaw, Inc.

Project: 100F Area Burial Grounds Remaining Sites - Soil -Waste Sites 100-F-38

& 128-F-2

Subject: Inorganics - Data Package No. K0080

## INTRODUCTION

This memo presents the results of data validation on Data Package No. K0080 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

a gainneile (1514)	ja Szamodel de Apres	Meddier Syn	e Vellidation is	er soDatës 274.
J10FT0	11/2/05	Soil	С	See note 1 & 2
J10FT1	11/2/05	Soil	C	See note 1 & 2
J10FT2	11/2/05	Soil	C	See note 1 & 2
J10FR9	11/2/05	Soil	С	See note 1 & 3

<sup>1 -</sup> ICP metals (6010B) and mercury (7471A.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work, Sampling and Analysis Plan for the 100 Area Remaining Sites (DOE/RL-99-58, Rev. 0, September 2000) and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, Rev. 4, February 2005). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers

Appendix 2. Summary of Data Qualification

Appendix 3. Qualified Data Summary and Annotated Laboratory Reports

Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation

Appendix 5. Data Validation Supporting Documentation

Appendix 6. Additional Documentation Requested by Client

### DATA QUALITY PARAMETERS

### Holding Times

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 28 days for mercury and 6 months for ICP metals.

All holding times were acceptable.

000001

<sup>2 -</sup> Waste site 100-F-38.

<sup>3 -</sup> Waste site 128-F-2.

## · Preparation (Method) Blanks

### Preparation Blanks

At least one preparation blank, consisting of deionized distilled water processed through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "U". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the contract required detection limit (CRDL), all nondetects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the instrument detection limit (IDL) and less than or equal to the CRDL, all nondetects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are greater than ten times the absolute value of the preparation blank, no qualification is necessary.

All preparation blank results were acceptable.

#### Field (Equipment) Blank

No equipment blanks were submitted for analysis.

#### Accuracy

## Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data . The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 130% and a sample result less than the IDL, no qualification is required.

Due to a matrix spike recovery outside QC limits (48.1%), all antimony results were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits (47.3%), all silicon results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

#### Precision

## Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

### Field Duplicate

No field duplicates were submitted for analysis.

### Analytical Detection Levels

Reported analytical detection levels are compared against the remaining waste sites RQLs to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

### Completeness

Data package No. K0080 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

## **MAJOR DEFICIENCIES**

None found.

## MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to a matrix spike recovery outside QC limits (48.1%), all antimony results were qualified as estimates and flagged "J".
- Due to an LCS recovery outside QC limits (47.3%), all silicon results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

#### **REFERENCES**

WCH, Contract #20266, Validation Statement of Work, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-96-22, Rev. 4, 100 Area Remedial Action Sampling and Analysis Plan, U.S. Department of Energy, February 2005.

DOE/RL-99-58, Rev. 0, Sampling and Analysis Plan for the 100 Area Remaining Sites, September 2000.

**Glossary of Data Reporting Qualifiers** 

Qualifiers which may be applied by data validators in compliance with BHI validation SOW are as follows:

- Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- BJ Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.
- R Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ Indicates presumptive evidence of a compound at an estimated value.

  The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2
Summary of Data Qualification

## **INORGANIC DATA QUALIFICATION SUMMARY\***

.adg: Kodag	REVIEWER THE	#Roject#c 100°E-98) ± 128°E-2	RAGE A COF IL
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Antimony	J	All	MS recovery
Silicon	J	All	LCS recovery

<sup>\* -</sup> The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Qualified Data Summary and Annotated Laboratory Reports

Project: WAS										
Lab: LLI		K0080				J10FT2				
Sample Numb	er _	J10FT0			J10FT1			J10FR9		
Waste site		100-F-38		100-F-38		100-F-38		128-F-2		
Remarks										
Sample Date		11/2/05		11/2/05		11/2/05		11/2/05		
Inorganics	RQL	Result	Q	Result	Q	Result	Q	Result	Q	
Silver_	0.2	0.14	U	0.14	U	0.15	U	0.14	U	
Aluminum		7770		4790		5850		4710		
Arsenic	10	2.4		1.8		2.4		2.0		
Boron		23.5		5.6		15.4		1.1		
Barium	2	388	_	105		237		60.8		
Beryllium		0.43		0.20	Ī.,	0.30		0.19		
Calcium		11000		4250		6840		4850		
Cadmium	0.2	0.1	I	0.07		0.12		0.11		
Cobalt		6.3		5.2		5.9	Г	6.4		
Chromium	1	14.5		7.0		12.2		8.0	Г	
Copper		18.0		11.8		14.8		10.2		
Iron		17900		12600		15200		17300	_	
Mercury	0.2	0.02	U	0.02	U	0.02	Ų	0.01	υ	
Potassium	1	1020		908		906		1010		
Magnesium		4900		3240	Γ.	3990	Γ.	4300		
Manganese		291		230		241		250		
Molybdenum	L	0.51		0.36		0.45	L <sup>-</sup>	0.29		
Sodium		404		176	_	321		148		
Nickel		10.8		8.3		9.6		10.1		
Lead	5	38.4		4.5		29.6		3.0		
Antimony		0.41		0.41		0.41		0.40	UJ	
Selenium	1	0.37	U	0.37	U	0.37	U	0.48		
Silicon		1230	J	864	j	824	J	764	J	
Vanadium		44.1		29.8		38.9		40.6		
Zinc	1	36.4		29.5		34.3		34.3		

#### INORGANICS DATA SUMMARY REPORT 11/15/05

CLIENT: TNUHANFORD RC-031 K0080 WORK ORDER: 11343-606-001-9999-00 LVL LOT #: 0511L633

					REPORTING	DILUTION
SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	LIMIT	PACTOR
******	***************	本中中中华医院医院国际有效为二二次 <b>与</b> 医院学是是	五二五五余七七金	E2228	****	******
-001	J10FT0	Silver, Total	0.14 u	MG/KG	0.14	1.0
		Aluminum, Total	7770	MG/KG	3.1	1.0
		Arsenic, Total	2.4	MG/KG	0.35	1.0
		Boron, Total	23.5	MG/KG	0.28	1.0
		Barium, Total	388	MG/KG	0.31	1.0
		Beryllium, Total	0.43	MG/KG	0.01	1.0
		Calcium, Total	11000	MG/KG	2.0	1.0
		Cadmium, Total	0.1	MG/KG	0.07	1.0
		Cobalt, Total	6.3	MG/KG	0.12	1.0
		Chromium, Total	14.5	MG/KG	0.16	1.0
		Copper, Total	18.0	MG/KG	0.30	1.0
		Iron, Total	17900	MG/KG	1.0	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1020	MG/KG	55.2	1.0
		Magnesium, Total	4900	MG/KG	3.5	1.0
		Manganese, Total	291	MG/KG	0.02	1.0
		Molybdenum, Total	0.51	MG/KG	0.13	1.0
		Sodium, Total	404	MG/KG	2.9	1.0
•		Nickel, Total	10.8	MG/KG	0.13	1.0
		Lead, Total	38.4	MG/KG	0.32	1.0
		Antimony, Total	0.41 u"	MG/KG	0.41	1.0
		Selenium, Total	0.37.น	MG/KG	0.37	1.0
		Silicon, Total	1230 1	MG/KG	0.84	1.0
		Vanadium, Total	44.1	MG/KG	0.09	1.0
		Zinc, Total	36.4	MG/KG	0.14	1.0

W/12/06

#### INORGANICS DATA SUMMARY REPORT 11/15/05

CLIENT: TNUHANFORD RC-031 K0080 WORK ORDER: 11343-606-001-9999-00 LVL LOT #: 0511L633

					REPORTING	DILUTION
SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	LIMIT	FACTOR
		*****************		=====	x=======	****
-002	J10FT1	Silver, Total	0.14 u	MG/KG	0.14	1.0
		Aluminum, Total	4790	MG/KG	3.1	1.0
		Arsenic, Total	1.8	MG/KG	0.35	1.0
		Boron, Total	5.6	MG/KG	0.28	1.0
		Barium, Total	. 105	MG/KG	0.31	1.0
		Beryllium, Total	0.20	MG/KG	0.01	1.0
		Calcium, Total	4250	MG/KG	2.0	1.0
		Cadmium, Total	0.07 u	MG/KG	0.07	1.0
		Cobalt, Total	5.2	MG/KG	0.12	1.0
		Chromium, Total	7.0	MG/KG	0.16	1.0
		Copper, Total	11.8	MG/KG	0.30	1.0
		Iron, Total	12600	MG/KG	1.0	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	90B	MG/KG	55.2	1.0
		Magnesium, Total	3240	MG/KG	3.6	1.0
		Manganese, Total	230	MG/KG	0.02	1.0
		Molybdenum, Total	0.36	MG/KG	0.13	1.0
		Sodium, Total	176	MG/KG	2.9	1.0
	·	Nickel, Total	8.3	MG/KG	0.13	1.0
	•	Lead, Total	4.5	MG/KG	0.32	1.0
		Antimony, Total	0.41 u	¶mg/kg	0.41	1.0
		Selenium, Total	0.37 u	MG/KG	0.37	1.0
		Silicon, Total	864 5	MG/KG	0.84	1.0
		Vanadium, Total	29.8	MG/KG	0.09	1.0
		Zinc, Total	29.5	MG/KG	0.14	1.0

#### INORGANICS DATA SUMMARY REPORT 11/15/05

CLIENT: TNUHANFORD RC-031 K0080 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0511L633

					REPORTING	DILUTION
SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	LIMIT	FACTOR
22223	*************	P. P	88==#### <b>#</b>	*=====	<b>宣览与寻开为二名在</b> 其	# <b>###</b>
-003	J10FT2	Silver, Total	0.15 u	MG/KG	0.15	1.0
		Aluminum, Total	5850	MG/KG	3.2	1.0
	•	Arsenic, Total	2.4	MG/KG	0.35	1.0
		Boron, Total	15.4	MG/KG	0.28	1.0
		Barium, Total	237	MG/KG	0.31	1.0
		Beryllium, Total	0.30	MG/KG	0.01	1.0
		Calcium, Total	6840	MG/KG	2.0	1.0
		Cadmium, Total	0.12	MG/KG	0.07	1.0
		Cobalt, Total	5.9	MG/KG	0.12	1.0
		Chromium, Total	12.2	MG/KG	0.17	1.0
		Copper, Total	14.8	MG/KG	0.30	1.0
		Iron, Total	15200	MG/KG	1.0	1.0
		Mercury, Total	0.02 u	мс/кс	0.02	1.0
		Potassium, Total	906	MG/KG	55.9	1.0
		Magnesium, Total	3990	MG/KG	3.6	1.0
		Manganese, Total	241	MG/KG	0.02	1.0
	•	Molybdenum, Total	0.45	MG/KG	0.13	1.0
		Sodium, Total	321	MG/KG	. 2.9	1.0
	•	Nickel, Total	9.6	MG/KG	0.13	1.0
		Lead, Total	29.6	MG/KG	0.32	1.0
		Antimony, Total	0.41 u	MG/KG	0.41	1.0
		Selenium, Total	. 0.37 u	MG/KG	0.37	1.0
		Silicon, Total	824 🎵	MG/KG	0.85	1.0
		Vanadium, Total	38.9	MG/KG	0.09	1.0
		Zinc, Total	34.3	MG/KG	0.15	1.0

1/12/06

#### INORGANICS DATA SUMMARY REPORT 11/15/05

CLIENT: TNUHANFORD RC-031 K0080 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0511L633

					REPORTING	DILUTION
SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	LIMIT	FACTOR
	*************	TING TING TO THE TING THE TIN	****	*****		****
-004	J10FR9	Silver, Total	0.14 u	MG/KG	0.14	1.0
		Aluminum, Total	4710	MG/KG	3.0	1.0
		Arsenic, Total	2.0	MG/KG	0.34	1.0
		Boron, Total	1.1	MG/KG	0.27	1.0
		Barium, Total	60.B	MG/KG	0.30	1.0
		Beryllium, Total	0.19	MG/KG	0.01	1.0
		Calcium, Total	4850	MG/KG	1.9	1.0
		Cadmium, Total	0.11	MG/KG	. 0.07	1.0
	:	Cobalt, Total	6.4	MG/KG	0.12	1.0
		Chromium, Total	8.0	MG/KG	0.16	1.0
		Copper, Total	10.2	MG/KG	0.29	1.0
		Iron, Total	17300	MG/KG	0.98	1.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Potassium, Total	1010	MG/KG	53.6	1.0
		Magnesium, Total	4300	MG/KG	3.4	1.0
		Manganese, Total	250	MG/KG	0.02	1.0
		Molybdenum, Total	0.29	MG/KG	0.13	1.0
		Sodium, Total	148	MG/KG	2.8	1.0
		Nickel, Total	10.1	MG/KG	0.13	1.0
		Lead, Total	3.0	MG/KG	0.31	1.0
		Antimony, Total	0.40 น_ิ	MG/KG	0.40	1.0
		Selenium, Total	0.48	MG/KG	0.36	1.0
		Silicon, Total	764 J	MG/KG	0.82	1.0
		Vanadium, Total	40.6	MG/KG	0.09	1.0
		Zinc, Total	34.3	MG/KG	0.14	1.0

1/12/01

Laboratory Narrative and Chain-of-Custody Documentation



**Analytical Report** 

Client: TNU-HANFORD RC-031

LVL#: 0511L633

SDG/SAF#: K0080/RC-031

W.O.#: 11343-606-001-9999-00

Date Received: 11-04-05

#### METALS CASE NARRATIVE

1. This narrative covers the analyses of 4 soil samples.

- 2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary. The samples were rerun for Aluminum, Barium, Calcium, Copper, Iron, Potassium, Magnesium, Sodium, and Zinc due to high concentrations and sample matrix.
- 3. All analyses were performed within the required holding times.
- 4. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
- 5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).
- 6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the POL).
- 7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.
- 8. All ICP Interference Check Standards were within control limits.
- 9. All laboratory control samples (LCS) were within the 80-120% control limits with the exception of Silicon at 47.3%. Refer to the Inorganics Laboratory Control Standards Report. Associated sample results may be biased low.
- 10. The matrix spike (MS) recoveries for 4 analytes were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.
- 11. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A PDS was prepared at meaningful concentration level for the following analytes:

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 22 pages.

000016

	•	<u>PDS</u>	<u>PDS</u>
Sample ID	<u>Element</u>	Concentration (ppb)	% Recovery
J10FT0	Aluminum	40,000	98.7
	Calcium	40,000	85.0
	Iron	40,000	80.2
	Antimony	100	89.9

- 12. The duplicate analyses for 2 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.
- 13. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.
- 14. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.
- 15. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels

Laboratory Manager

Lionville Laboratory Incorporated

jjw/m11-633

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Washington C	losure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST  Company Contact Telephone No. Project Coordinator								RC-031-008	Page I	of 1
Collector COFFMAN			R T Coffman 528-6409 KESSNER, JH							Price Cod	le	Data T	urnaround
Project Designation 100-F Burial Grounds	Remaining Sites - Soil Quic								SAF No. RC-031			15	DAY
Ice Chest No. E	RC-01-040	> F	ield Logbook No. EFL-1174	COA R126F22	000		Method of SI FED X	doment	<u>'</u>				
Shipped To EBERLINE SERVICE	87 LIONVILLE	0	ffsite Property No.	4060	104		_	Bill of Ladin	e/Air Bill	No.	322 0	SPC	ě
POSSIBLE SAMPLE F	AZARDS/REMARKS								1				7
NA.			Preservation	None	None	Cool 4C	Cool 4	C Cool 4C	None	•	1	1	
Special Handling and	Ver Storage		Type of Container	aG	aO	aG	аG	aG	P				
Cool 4 deg. C			No. of Container(s)	1	1	1	1	į i	1 1		į		"-
	÷		Volume	60mL	60mL	60mL	60mL	. 60mL	1000	nL .			
	SAMPLE ANA	ĹYSIS		See item (1) in Special Instructions.	ICP Metals - 6010A (Add- on) (Antimosy, Berylliam, Nickel, Thalliam)	Chromiust Hex - 7196	PCBs - 8	082 Semi-VOA - 8270A (TCI	See it m ( Specia Instruction	1			
Sample No.	Matrix *	Sample Da	ate Sample Time										
J10FT0	SOIL	11/2	105 1230	X	X	X	X	X	X			CENTER	
J10FT1	SOIL	11/2/	105 1245	X	X	X	K	X	X			South	
J10FT2	SOIL	11/2/	05 1300	X	χ.	X	X	X	人			NORTH	
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CTAIN OF BOSES	PETON .			<u> </u>	<u> </u>					11	<u>.].</u>	<u> </u>	1 4 a ta i - 1
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LABORATORY   Receive	ed By	l <u></u>	<u> </u>	Titl	ie .			··· · · · · · · · · · · · · · · · · ·			D	ale/Time	<u> </u>
SECTION	· · · · · · · · · · · · · · · · · · ·		<del></del>	<del> </del>	<del>-</del>	·		=			····		
FINAL SAMPLE Dispos DISPOSITION	al Method					Dispos	sed By			· <del>-</del>	I	Date/Time	

Washingto	on Clost	re Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST									RC-031-007			Page 1 of 1		
Collector COFFMAN			(								iect Coordin: SSNER, JH	itor	Price C	Code		Data T	urnaround	
Project Designation		aining Sites - Soil Quick							SAF No. RC-031			Air Qu	uality	' 🗆	15	2YAQ		
Ice Chest No.	E6	26-01-040	I	Field Logbook No. EFL-1174			COA R126F22	000		I		hod of Sblom ED X	ent					
Shipped To EBERLINE SEI	RVICES / L	IONVILLE	(	Offsite	Property No.	10601	04				Bill	of Lading/Ai	ir Bill	<sup>N₀.</sup> S	ee	0500		
		ARDS/REMARKS				T	<del>                                     </del>	<u> </u>	$\Pi$		٦					Ţ <del></del> -		T
NA					Preservation	None	None	Cool 4C	1 1	lone						1	·	
Special Handlin	sø and/or l	Storage			Type of Container	aG	аG	aG		P								
Cool 4 deg. C	-6 mm				No. of Container(s)	1	1	1		1	Ī							
					Volume	60ml.	60mL	60mL	100	OmL	-						•	1
		SAMPLE ANAL	YSIS			See item (1) in Special Instructions.	ICP Metakr 6010A (Add on) (Antimony, Beryllium, Nickel, Thallium)	Chromium Hex - 7196	Sp	'סו					•			
Sample N	ło.	Matrix *	Sample I	Date	Sample Time	100			4.1			VELEKT EIN		54 46 5	n C		¥***-1	
J10FR9		SOIL	11/2/	105	1200	X	X	X	X	7								
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•											П							T .
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CHAIN OF P	OSSESSIO			Print	Names			CIAL INSTI	LUCT	ION	S					· · · · ·		Matrix *
Relinquished By/Remover Coffee By/Remover	yed From 2 A yed From 4 CA yed From	Date/Time 1600  Date/Time  (1 3 0 5 1000  Date/Time  (1 3 0 5 1000  Date/Time  11 4 05 000  Date/Time	Received By Received By	//Store	d in Da	ate/Time  11/2/C  tte/Time  tte/Time  tte/Time	Cade Nick (2) (Euro	nium, Calcium, el, Potassium, S Jamma Spectro	Chromi ielenium scopy (	ium ( n. Sili TCL	Coba licon, List)	Aluminum, Anti alt, Copper, Iron , Silver, Sodium, ) (Cesium-137, ( on (Americium-	, Lead, i Vanadi Cobalt-0	Magnesium iom, Zinc}; 60, Europiu	n Man Mercu m-152,	zanese, Molybdo ry - 7470 - (CV Europium-154,	enunı, /)	S-Soil SE-Sotineau SC-Soild SI-Studge W = Water O-Oil A-Air DS-Drum Soilds DtDrum Liquir T-Tisone WI-Wipe L-Liquid V-Vegetation X-Other
Relinquished By/Remov	ved From	Date/Time	Received By	y/Store	d In Da	ite/Time										•		
LABORATORY SECTION	Received By	,			<del></del> -	Titl	e	-								Da	te/Time	<u>-                                      </u>
FINAL SAMPLE DISPOSITION	Disposal Mo	ethod	·					Dispo	sed By	-			_			Da	ate/Time	

**Data Validation Supporting Documentation** 

<u>V</u> ALIDATION LEVEL:	A	В	(c)	D	E
PROJECT: 100	-F-38 128	-F-Z	DATA PACKAG	E: 16008	ව
VALIDATOR:		LAB: LLT		DATE:   C	105
			SDG:	KOUSG	<del></del>
		ANALYSES	PERFORMED	<del></del>	
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MAT	RIX				
J104	To JI	OPTI JI	0F72	JIOFRA	<del></del>
		·	·	<del></del>	Soil
			CASE NARRATIV		
Technical verificati Comments:		•			Yeé No N/A
2. INSTRUM			IBRATIONS (Lev	•	Yes No N/A
Initial calibrations a					1 1
ICP interference ch	<del>-</del>				1 1
ICV and CCV chec					1 1
ICV and CCV chec					
Standards traceable					, , ,
Standards expired?	*************************	************************	**************	*************************	Yes No N/A
Calculation check a	cceptable?	***************************************	***************************************		Yes No N/A
Comments:	<del> </del>				
	. <u> </u>				
···.					

3.	BLANKS (Levels B, C, D, and E)			4
ICB a	nd CCB checks performed for all applicable analyses? (Levels D, E)	Yes	No	(N/A)
ICB a	nd CCB results acceptable? (Levels D, E)	Yes	No(	(N/A)
Labor	atory blanks analyzed?	Yes	No	N/A
Labor	atory blank results acceptable?	Yes	No	N/A
Field l	blanks analyzed? (Levels C, D, E)	Yes	No	N/A
Field	blank results acceptable? (Levels C, D, E)	Yes	No	N/A
Trans	cription/calculation errors? (Levels D, E)	Yes	No	N/A
Comn	nents:			
	·	<del></del>		
		<del></del>		
	ACCUPACE CONTRACTOR			
4. 	ACCURACY (Levels C, D, and E)		١	****
	ISD samples analyzed?		_	
	ISD results acceptable?			_
	ISD standards NIST traceable? (Levels D, E)			>-<
	ISD standards expired? (Levels D, E)	_		
	BSS samples analyzed?	1 1	,	
LCS/E	BSS results acceptable?	Yes	(NO)	N/A
	ards traceable? (Levels D, E)			$\sim$
	ards expired? (Levels D, E)			_
Transo	cription/calculation errors? (Levels D, E)	Yes	No	(N/A
Perfor	mance audit sample(s) analyzed?	Yes	No	N/A
Perfor	mance audit sample results acceptable?	Yes	No	(M/A
Comm	ments: and my - MS-T			
	Silven - LCS-J			
<del>_</del> _				
				·
,				
		•		

5. PRECISION (Levels C, D, and E)	
Duplicate RPD values acceptable?	Yes No N/A
Duplicate results acceptable?	
MS/MSD standards NIST traceable? (Levels D, E)	Yes No N
MS/MSD standards expired? (Levels D, E)	Yes No N/A
Field duplicate RPD values acceptable?	Yes No N/A
Field split RPD values acceptable?	Yes No N/A
Transcription/calculation errors? (Levels D, E)	Yes No N/A
Comments:	
	•
6. ICP QUALITY CONTROL (Levels D and E)	
ICP serial dilution samples analyzed?	Yes No (N/A
ICP serial dilution %D values acceptable?	}
ICP post digestion spike required?	1
ICP post digestion spike values acceptable?	i
Standards traceable?	Yes No N/A
Standards expired?	j j
Transcription/calculation errors?	Yes No N/
Comments:	

7.	FURNACE AA QUALITY CONTROL (Levels D and E)		,
Dupli	icate injections performed as required?Yes	No	N/A
	icate injection %RSD values acceptable?Yes		1
Analy	ytical spikes performed as required? Yes	No	N/A
Analy	ytical spike recoveries acceptable? Yes	No	N/A
Stand	lards traceable?Yes	No	N/A
Stand	lards expired?Yes	Nd	N/A
MSA	performed as required?	No	N/A
MSA	results acceptable?	No	N/A
Trans	scription/calculation errors? Yes	Nd	N/A
Com	ments:		
			•
8.	HOLDING TIMES (all levels)		
Samp	oles properly preserved?	No	N/A
Samp		No	N/A
Com	ments:		
_			

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)		
Results reported for all requested analyses?	(Yes	No N/A
Rresults supported in the raw data? (Levels D, E)	Yes	No NA
		1 200
Samples properly prepared? (Levels D, E)  Detection limits meet RDL?	(. Yes	No N/A
Transcription/calculation errors? (Levels D, E)	Yes	No (N/A
Comments:		
,		
	<u> </u>	
		· · · · · · · · · · · · · · · · · · ·
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**Additional Documentation Requested by Client** 

## INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/15/05

CLIENT: TNUHANFORD RC-031 K0080 WORK ORDER: 11343-606-001-9999-00 LVL LOT #: 0511L633

					REPORTING	DILUTION
SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	LIMIT	FACTOR
3524532	\$100 m	工工者 医经常性 化苯甲基甲基苯甲苯甲基甲甲甲	23632223	***===	4=3===±±=	#### <b>#</b>
BLANK1	05L0648-MB1	Silver, Total	0.14 u	MG/KG	0.14	1.0
		Aluminum, Total	3.0 u	MG/KG	3.0	1.0
		Arsenic, Total	0.34 u	MG/KG	0.34	1.0
		Boron, Total	0.27 u	MG/KG	0.27	1.0
		Barium, Total	0.30 u	MG/KG	0.30	1.0
		Beryllium, Total	0.01 u	MG/KG	0.01	1.0
		Calcium, Total	2.0	MG/KG	2.0	1.0
		Cadmium, Total	0.07 u	MG/KG	0.07	1.0
		Cobalt, Total	0.12 น	MG/KG	0.12	1.0
		Chromium, Total	0.16 u	MG/KG	0.16	1.0
	•	Copper, Total	0.29 u	MG/KG	0.29	1.0
		Iron, Total	1.0	MG/KG	0.99	1.0
		Potassium, Total	81.7	MG/KG	54.0	1.0
		Magnesium, Total	3.5 u	MG/KG	3.5	1.0
		Manganese, Total	0.02 u	MG/KG	0.02	1.0
		Molybdenum, Total	0.13 u	MG/KG	0.13	1.0
		sodium, Total	3.7	MG/KG	2.8	1.0
		Nickel, Total	0.13 u	MG/KG	0.13	1.0
		Lead, Total	0.31 u	MG/KG	0.31	1.0
		Antimony, Total	0.40 u	MG/KG	0.40	1.0
		Selenium, Total	0.36 u	MG/KG	0.36	1.0
		Silicon, Total	4.9	MG/KG	0.82	1.0
		Vanadium, Total	0.09 Ա	MG/KG	0.09	1.0
		Zinc, Total	0.14 u	MG/KG	0.14	1.0
BLANKI	05C0265-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

#### INORGANICS ACCURACY REPORT 11/15/05

CLIENT: TNUHANFORD RC-031 K0080
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0511L633

			SPIKED	INITIAL	SPIKED		DILUTION
SAMPLE	SITE ID	ANALYTE	SAMPLE	RESULT	AMOUNT	*RECOV	Pactor (spk)
=======	요요요요요요요요요요요요요요요요요	***************	2524888		3529=3	2==2==	******
-001	J10FT0	Silver, Total	4.6	0.14u	5.2	08.5	1.0
		Aluminum, Total	8910	7770	207	553.9*	1.0
		Arsenic, Total	183	2.4	207	87.5	1.0
		Boron, Total	113	23.5	103	86.8	1.0
		Barium, Total	590	388	207	97.7	1.0
		Beryllium, Total	5.2	0.43	. 5.2	91.7	1.0
		Calcium, Total	12200	11000	2580	46.3*	1.0
		Cadmium, Total	4.7	0.1	5.2	88.5	1.0
		Cobalt, Total	53.4	6.3	51.6	91.3	1.0
		Chromium, Total	34.5	14.5	20.7	96.6	1.0
		Copper, Total	44.2	18.0	25.8	101.6	1.0
		Iron, Total	17500	17900	103	-360. *	1.0
		Mercury, Total	0.18	0.02u	0.16	113.5	1.0
		Potassium, Total	3530	1020	2580	97.2	1.0
		Magnesium, Total	7590	4900	2580	104.0	1.0
		Manganese, Total	343	291	51.6	100.6*	1.0
		Molybdenum, Total	93.3	0.51	103	89.8	1.0
		Sodium, Total	2980	404	2580	99.6	1.0
		Nickel, Total	58.2	10.8	51.6	91.9	1.0
		Lead, Total	86.7	38.4	51.6	93.6	1.0
		Antimony, Total	24.8	0.4lu	51.6	48.1	1.0
		Selenium, Total	177	0.37u	207	85.5	1.0
		Silicon, Total	1350	1230	103	114.1*	1.0
		Vanadium, Total	93.6	44.1	51.6	95.9	1.0
		Zinc, Total	85.5	36.4	51.6	95.2	1.0

#### INORGANICS PRECISION REPORT 11/15/05

CLIENT: TNUHANFORD RC-031 K0080 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0511L633

			INITIAL			DILUTION
SAMPLE	SITE ID	Analyte	RESULT	REPLICATE	RPD	FACTOR (REP)
======	=======================================		20626758	****	*****	프로프로그램보드루크늄
-001REP	J10FT0	Silver, Total	0.14u	0.14u	NC	1.0
		Aluminum, Total	7770	7180	7.9	1.0
		Arsenic, Total	2.4	2,4	0.00	. 1.0
		Boron, Total	23.5	21.5	8.9	1.0
		Barium, Total	388	351	9.9	1.0
		Beryllium, Total	0.43	0.43	0.95	1.0
		Calcium, Total	11000	8720	23.3	1.0
		Cadmium, Total	0.1	0.10	5.1	1.0
		Cobalt, Total	6.3	6.5	3.1	1.0
		Chromium, Total	14.5	13.2	9.4	1.0
		Copper, Total	18.0	17.2	4.5	1.0
		Iron, Total	17900	16100	10.5	1.0
		Mercury, Total	0.024	0.02u	NC	1.0
		Potassium, Total	1020	983	3.6	1.0
		Magnesium, Total	4900	4580	6.9	1.0
		Manganese, Total	291	250	15.0	1.0
		Molybdenum, Total	0.51	0.44	15.6	1.0
		Sodium, Total	404	424	4.8	1.0
		Nickel, Total	10.8	11.5	6.3	1.0
		Lead, Total	38.4	35.4	8.1	1.0
		Antimony, Total	0.41u	0.41u	NC	1.0
		Selenium, Total	0.37u	0.37u	NC	1.0
		Silicon, Total	1230	997	21.0	1.0
		Vanadium, Total	44.1	40.9	7.5	1.0
		Zinc, Total	36.4	35.5	2.5	1.0

## INORGANICS LABORATORY CONTROL STANDARDS REPORT 11/15/05

CLIENT: TNUHANFORD RC-031 K0080 WORK ORDER: 11343-606-001-9999-00 LVL LOT #: 0511L633

			SPIKED	SPIKED		
SAMPLE	SITE ID	ANALYTE	SAMPLE	AMOUNT	UNITS	*RECOV
**==**	= 2222274622222222		======	E=====	<b>48888</b>	프로디유는그
LCS1	05L0648-LC1	Silver, LCS	47.6	50.0	MG/KG	95.2
		Aluminum, LCS	480	500	MG/KG	96.1
		Arsenic, LCS	916	1000	MG/KG	91.6
	, i	Boron, LCS	465	500	MG/KG	92.9
		Barium, LCS	500	500	MG/KG	100
		Beryllium, LCS	23.8	25.0	MG/KG	95.2
		Calcium, LCS	2310	2500	MG/KG	92.6
		Cadmium, LCS	23.7	25.0	MG/KG	94.8
		Cobalt, LCS	241	250	MG/KG	96.3
		Chromium, LCS	48.4	50.0	MG/KG	96.8
		Copper, LCS	120	125	MG/KG	96.3
		Iron, LCS	473	500	MG/KG	94.5
		Potassium, LCS	2430	2500	MG/KG	97.4
		Magnesium, LCS	2320	2500	MG/KG	92.7
		Manganese, LCS	72.3	75.0	MG/KG	96.4
		Molybdenum, LCS	480	500	MG/KG	95.9
		Sodium, LCS	2390	2500	MG/KG	95.7
		Nickel, LCS	190	200	MG/KG	94.8
		Lead, LCS	235	250	MG/KG	93.8
		Antimony, LCS	276	300	MG/KG	92.1
		Selenium, LCS	895	1000	MG/KG	89.5
		Silicon, LCS	237	500	MG/KG	47.3
		Vanadium, LCS	241	250.	MG/KG	96.2
	•	Zinc, LCS	91.7	100	MG/KG	91.7
LCS1	05C0265-LC1	Mercury, LCS	6.4	2.9	мо/ко	102.9 11/17/05

Date:

12 January 2006

To:

Washington Closure Hanford Inc. (technical representative)

From:

TechLaw, Inc.

Project:

100F Area Burial Grounds Remaining Sites - Soil -Waste Sites 100-F-38

& 128-F-2

Subject: Radiochemistry - Data Package No. K0080

### INTRODUCTION

This memo presents the results of data validation on Data Package No. K0080 prepared by Eberline Services (EB). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table,

Samole ID:	Sample Dailet	Ava Media 🔭	z Valldarion	Dare
J10FT0	11/2/05	Soil	С	See note 1 & 2
J10FT1	11/2/05	Soil	С	See note 1 & 2
J10FT2	11/2/05	Soil	С	See note 1 & 2
J10FR9	11/2/05	Soil	С	See note 1 & 3

- 1 Gamma spectroscopy.
- 2 Waste site 100-F-38.
- 3 Waste site 128-F-2.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work, Sampling and Analysis Plan for the 100 Area Remaining Sites (DOE/RL-99-58, Rev. 0, September 2000) and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, Rev. 4, February 2005). Appendices 1 through 6 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation
- Appendix 6. Additional Data Requested by Client

#### DATA QUALITY PARAMETERS

## · Holding Times

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analysis is 6 months.

All holding times were acceptable.

000001

## · Preparation (Method) Blanks

### Laboratory Blanks

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above the minimum detectable activity (MDA), the following qualifiers are applied: All positive sample results less than five times the highest blank concentration are qualified as estimates and flagged "J"; sample results below the MDA are qualified as undetected and flagged "U"; sample results above the MDA and greater than five times the highest blank concentration are not qualified.

All blank results were acceptable.

### Field (Equipment) Blank

No equipment blanks were submitted for analysis.

### · Accuracy

Accuracy is evaluated from laboratory control sample (LCS) or blank spike sample (BSS) batch samples and spiked samples from the analytical batch. Measured activities are compared to the known added amounts. The acceptable LCS or BSS and matrix spike (MS) recovery range is 80-120%. In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, or not qualified, depending on the activity of the individual sample. Results are rejected for LCS/BSS recoveries of less than 30% and tracer recoveries of less than 20%, and tracer recoveries of greater than 115% for detected results.

All accuracy results were acceptable.

### Laboratory Duplicates

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the contract required detection limit (CRDL) and the RPD is less than 30%, no qualification is required. If

either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

Due to an RPD outside QC limits (32%), all thorium-228 results were qualified as estimates and flagged "J".

All other duplicate results were acceptable.

## Field Duplicates

No field duplicates were submitted for analysis.

#### Detection Levels

Reported analytical detection levels for undetected analytes are compared against the remaining waste site RQLs to ensure that laboratory detection levels meet the required criteria. Eight analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

#### Completeness

Data package No. K0080 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

#### **MAJOR DEFICIENCIES**

None found.

#### MINOR DEFICIENCIES

Due to an RPD outside QC limits (32%), all thorium-228 results were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

Eight analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

000003

#### REFERENCES

WCH, Contract #20266, Validation Statement of Work, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-96-22, Rev. 4, 100 Area Remedial Action Sampling and Analysis Plan, U.S. Department of Energy, February 2005.

DOE/RL-99-58, Rev. 0, Sampling and Analysis Plan for the 100 Area Remaining Sites, September 2000.

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the BHI statement of work are as follows:

- Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.
- UJ Indicates the compound or analyte was analyzed for and not detected at concentrations above the minimum detectable activity (MDA) in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate, but is usable for decision making purposes.
- J Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- R Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

**Summary of Data Qualification** 

## RADIOCHEMISTRY DATA QUALIFICATION SUMMARY\*

Spackouser -	FEX EWER TU	######################################	BAGE 7 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Thorium-228	J	All	RPD

<sup>\* -</sup> The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Qualified Data Summary and Annotated Laboratory Reports

roject: WASHINGTON CLOSURE HANFORD				]						
Laboratory: EB	SDG: I	<b>C0080</b>								
Sample Number		J10FT0		J10FT1		J10FT2			J10FR9	
Waste Site		100-F-38	3	100-F-38		100-F-38			128-F-2	
Remarks								Ĺ		
Sample Date		11/2/05		11/2/05		11/2/05			11/2/05	
Radiochemistry	RQL	Result	a	Result	Q	Result	Q	RQL	Result	Q
Potassium-40		11.9		12.6		23.8		<u> </u>	13.5	
Cobalt 60	0.05	U	U	U	U	Ū	Ū	0.05	Ú	C
Cesium 137	0.05	U	U	U	U	U	U	0.1	ָר י	U
Radium-226		0.520		0.546		0.957			0.535	
Radium-228		0.687		0.739	$\Gamma$	1.36		I	0.772	
Europium 152	0.1	U	U	U	U	U	U*	[	Ü	Ü
Europium 154	0.1	U	U	_ U	U*	U	U*_	0.1	Ú	U*
Europium 155	0.1	U	U	U	U	U	U*	0.1	U	U*
Thorium-228		0.802	J	0.576	J	1.27	J_		0.785	J
Thorium-232		0.687		0.739		1.36			0.772	
Uranium-235(gea)		U	υ	U	U	U	U		U	G
Uranium-238(gea)		U	U	U	U	U	U_	l	ט	C
Americium-241(gea)		U	U	Ü	U	U	U		U	U

#### EBERLINE SERVICES / RICHMOND SAMPLE DELIVERY GROUP K0080

7768-002

#### DATA SHEET

J10FT0

<u> </u>	7768 Melissa C. Mannion	Client/Case no Contract		_
Lab sample id Dept sample id Received % solids	7768-002 11/04/05	Client sample id Location/Matrix Collected/Weight Custody/SAF No	100 F/100-F-38 SOLID 11/02/05 12:30 1554 q	<del>-</del>

ANALYTE	CAS NO	RESULT pCi/g	20 ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Potassium 40	13966-00-2	11.9	1.0	0.28			GAM
Cobalt 60	10198-40-0	ט		0.044	0.050	Ú	GAM
Cesium 137	10045-97-3	U		0.039	0.10	U	GAM
Radium 226	13982-63-3	0.520	0.074	0.070	0.10		GAM
Radium 228	15262-20-1	0.687	0.15	0.16	0.20		GAM
Europium 152	14683-23-9	U		0.11	0.10	U	GAM
Europium 154	15585-10-1	ซ		0.15	0.10	U	GAM
Europium 155	14391-16-3	ប		0.084	0.10	ָ ט	GAM
Thorium 228	14274-82-9	0.802	0.058	0.053		7	GAM
Thorium 232	TH-232	0.687	0.15	0.16			GAM
Uranium 235	15117-96-1	U		0.13		U	GAM
Uranium 238	U-238	Ū		4.8		Ū	GAM
Americium 241	14596-10-2	. <b>U</b>		0.055		บ	GAM

100F BurialGrnds.Remaim.Sites-SoilQT

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#### EBERLINE SERVICES / RICHMOND SAMPLE DELIVERY GROUP K0080

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7768-004

#### DATA SHEET

J10FT2

7768 Melissa C. Mannion	Client/Case no Contract		SDG_K0080
	Client sample id Location/Matrix Collected/Weight Custody/SAF No	100 F/100-F-38 11/02/05 13:00	SOLID 1605 g RC-031

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Potassium 40	13966-00-2	23.8	1.4	0.39			GAM
Cobalt 60	10198-40-0	บ		0.046	0.050	Ŭ	GAM
Cesium 137	10045-97-3	U .		0.042	0.10	ซ	GAM
Radium 226	13982-63-3	0.957	0.094	0.080	0.10		GAM
Radium 228	15262-20-1	1.36	0.17	0.15	0.20		GAM
Europium 152	14683-23-9	ប		0.12	0.10	Ū	GAM
Europium 154	15585-10-1	บ		0.14	0.10	υ	GAM
Europium 155	14391-16-3	ט		0.18	0.10	U <sub>A</sub>	GAM
Thorium 228	14274-82-9	1.27	0.062	0.058		1	GAM
Thorium 232	TH-232	1.36	0.17	0.15			GAM
Uranium 235	15117-96-1	U		0.20		U	GAM
Uranium 238	U-238	U		5.2		ש	GAM
Americium 241	14596-10-2	Ū		0.41		บ ๋	GAM

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## EBERLINE SERVICES / RICHMOND SAMPLE DELIVERY GROUP K0080

7768-003

#### DATA SHEET

J10FT1

	7768 Melissa C. Mannion	Client/Case no Contract		SDG_K0080
Lab sample id Dept sample id Received % solids	7768-003 11/04/05	Client sample id Location/Matrix Collected/Weight Custody/SAF No	100 F/100-F-38 11/02/05 12:45	SOLID 1682 g RC-031

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	Quali- Fiers	TEST
Potassium 40	13966-00-2	12.6	0.72	0.31			GAM
Cobalt 60	10198-40-0	U		0.037	0.050	ប	GAM
Cesium 137	10045-97-3	U		0.030	0.10	บ	GAM
Radium 226	13982-63-3	0.546	0.060	0.053	0.10		GAM
Radium 228	15262-20-1	0.739	0.17	0.16	0.20		GAM
Europium 152	14683-23-9	U		0.082	0.10	ប	GAM
Europium 154	15585-10-1	U ·		0.11	0.10	U	GAM
Europium 155	14391-16-3	U		0.10	0.10	<b>U</b> -	GAM
Thorium 228	14274-82-9	0.576	0.036	0.035		J	GAM
Thorium 232	TH-232	0.739	0.17	0.16			GAM
Uranium 235	15117-96-1	U		0.15		ប	GAM
Uranium 238	U-238	· ប		3.7		ប	GAM
Americium 241	14596-10-2	Ü		0.27		U	GAM

100F BurialGrnds.Remaim.Sites-SoilQT

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## EBERLINE SERVICES / RICHMOND SAMPLE DELIVERY GROUP K0080

7768-001

#### DATA SHEET

J10FR9

	7768 Melissa C. Mannion	Client/Case no Contract	
Lab sample id Dept sample id Received % solids	7768-001 11/04/05		100F/126F2 LightSandyAsh SOLID 11/02/05 12:00 1454 q

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Potassium 40	13966-00-2	13.5	0.80	0.32			GAM
Cobalt 60	10198-40-0	U		0.036	0.050	ប	GAM
Cesium 137	10045-97-3	U		0.032	0.10	U	GAM
Radium 226	13982-63 <b>-</b> 3	0.535	0.082	0.072	0.10		GAM
Radium 228	15262-20-1	0.772	0.17	0.16	0.20		GAM
Europium 152	14683-23-9	U		0.088	0.10	ט	GAM
Europium 154	15585-10-1	U		0.13	0.10	ប	GAM
Europium 155	14391-16-3	บั		0.12	0.10	ប្	GAM
Thorium 228	14274-82-9	0.785	0.066	0.066		1	GAM
Thorium 232	TH-232	0.772	0.17	0.16			GAM
Uranium 235	15117-96-1	U		0.16		U	GAM
Uranium 238	U-238	Ū		4.2		ប	GAM
Americium 241	14596-10-2	υ		0.29		U	GAM

100F BurialGrnds.Remaim.Sites-SoilQT

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#### Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

#### Eberline Services W.O. No. R5-11-059-7768

**Case Narrative** 

Page 1 of 1

#### 1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K0080 was composed of four solid (soil) samples designated under SAF No. RC-031 with a Project Designation of: 100-F Burial Grounds Remaining Sites – Soil Quick Turn.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to WCH via e-mail on December 1, 2005.

#### 2.0 ANALYSIS NOTES

#### 2.1 Gamma Spectroscopy

No problems were encountered during the course of the analyses.

#### **Case Narrative Certification Statement**

"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data obtained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

Melissa C. Mannion

Senior Program Manager

nu Mann

Date

Washington	Washington Closure Hanford CHAIN OF CUSTODY/				AMPL	E ANAL	YSIS	REQUES	r	RC	-031-008	Page 1	of <u>1</u>
Collector COFFMAN			any Contact Coffman	Telepho 528-6				Project Coord KESSNER, JH	inator	Price Code		Data Tu	rnaround
Project Designation 100-F Burial Groun	ds Remaining Sites - Soil Quick 1		ling Location F/100-F-38	008D	(7768	7768 SAF No. RC-031			Air Quality [		15	DAy	
Ice Chest No.	FRC-02603		Logbook No. 1174	/	COA R126F22	COA Method of Shipment 126F22000 FED X							
Shipped To EBERLINE SERVI		Offsit	e Property No.	406	30 08	36		Bill of Lading	'Air Bill l	No. Se	c 05/	~	
POSSIBLE SAMPL	E HAZARDS/REMARKS		T S	1					Ĭ				
NA			Preservation	None	None	Cool 4C	Cool 4	C Cool 4C	None	_			
Special Handling and/or Storage			Type of Container	aG	aG	aG	aG	aG	P	<u> </u>			ļ
Cool 4 deg. C			No. of Container(s)	1	\ '	1	1	1	1				ĺ
			Volume	60mL	60 GL	60mL	60ml	. 60mL	1000ml				
000017	SAMPLE ANAL	ysis		See item (1) in Special Instructions.	ICP Metals - 6010A (Add- oo) {Antimony, Beryllium, Nickel, Thallium}	Chromium Hex - 7196	PCBs - 8	082 Scmi-VOA - 8270A (TCL)	See item (2) Special Instruction				
Sample No.	Matrix *	Sample Date	Sample Time		e v Copi and Agenty								
J10FT0	SOIL	11/2/0	_	X	Y	Y	X	X	Y			CENTER	
J10FT1	SOIL	112/05	1245	X	X	X	X	X	X			South	1
J10FT2	SOIL	11/2/05	1300	X	X	X	Ÿ	X	入			NORTH	-
CHAIN OF POS	SERGSION	Sign/Print	Names	<u> </u>	ODE	TAY DIOTO	LIOTTO:			<u> </u>			Matrix *
Relinquished By/Removed	15.60			ite/Time 160	SPEC	CIAL INSTR	UÇTIO	NS					1
RT COFFMAN/	RT Coffma 11/2/05	1 🔿		11/2/0	77-	CD Matrile 601	A (Cliant	List) (Aluminum, A	antimonic A	Longo Davison 1	andium Doss		S=Soil SE=Sodiment
Relinquished By/Removed		Received By/Ston	ed lu Da	te/Time	Cadin	nium, Calcium, (	Chromiun	i, Cobalt, Copper, I	ron, Lead, l	Magnesium, Man	ganese, Molybdo	enum,	SO~Sotial SI~Sludge W = Water
3728 Ref		Received By/Store	ed In Da	do) こう	(2) (	iamma Spectros	сору (ТС	Silicon, Silver, Sodi L List) (Cesium-13 - Add-on (Americi	7, Cobalt-6	i0, Europium-152	, Buropium-154,		O≃Oil A∈Air DS≖Drum Solids
1 Sand	11   3   0   0   0		<u> </u>	I m:	· `		•						DL-Drum Liquids T=Tissue
Relinquished By/Removed	X 1104102	Received By/Ston	11 0 1	Time 9:	30								W]=Wipe L=Liquid V=Vegetation
Relinquished By/Removed	From Date/Time	Received By/Store	ed In Da	te/Time									X=Other
Relinquished By/Removed	From Date/Time	Received By/Store	ed In Da	ste/Time						-			
LABORATORY RESECTION	eceived By		,	Titl	c .				<u>-</u>		Da	ite/Time	L <u></u>
FINAL SAMPLE DISPOSITION	isposal Method		-			Dispo	sed By			·	D	ate/Time	

			<del></del>									<del>-,</del>	
<b>—</b>	losure Hanford		HAIN OF CUST			ANAL	<u>YSIS</u>			RO	RC-031-007 Page 1 of 1		
Collector COFFMAN			any Contact Coffman	Telephor 528-64				Project Coordi KESSNER, JH	ator	Price Code		Data Tı	urnaround
Project Designation 100-F Burial Grounds	Remaining Sites - Soil Quick To		ing Location F / 126-F-2, Light sandy	KOOSC ash materia		(8)		SAF No. RC-031		Air Qualit	у 🗆	15	DAYS
Ice Chest No.	RC-62-003		Logbook No. -1174		COA R126F220	00		Method of Ship FED X	ment				
Shipped-Po- EBERLINE SERVIC	ES) LIONVILLE	Offsite	e Property No.	A060086 Bill of Lading/Air Bill No.				No. 5-2	see osec				
POSSIBLE SAMPLE	HAZARDS/REMARKS												
NA			Preservation	None	None	Cool 4C	None	e	_				
Special Handling an	Special Handling and/or Storage			ab	aG	aG	P						
Cool 4 deg. C			No. of Container(s)	'\	1	1	ī						1
	•		Volume	60mL	FUE I	60mL	1000s	πL					
000018	SAMPLE ANALY	rsis		See item (1) in Special Instructions.	IGP Metals - 60 OA (Add- on) (Anthrony, Beryllum, Nicke Thallium)	Chromium Hex - 7196	See item Speci Instruct	al					
Sample No.	Matrix *	Sample Date	Sample Time										
J10FR9	SOIL	11/2/05	1200	χ	X	/ x	X			Say a med the older was discussed and		16.	
		<del></del>											<del></del>
										_			
						1							
		· · · · · · · · · · · · · · · · · · ·										<del></del>	
CHAIN OF POSS	ESSION	Sign/Print	Names	<del>1</del>	SPEC	IAL INSTR	UCTIO	NS	_		<u> </u>	l —	Matrix *
Relinquished By/Removed Fr RTCoFFWAJ/	FT Coffme_ 11/2/05	Received By/Stor	<sup>H</sup> OA .3728	11/2/6	(I) IC	TP Metals - 60	10 (Client	: List) (Aluminum, A	ntimony,	Arsenic, Barium,	Beryllium, Boro	on,	S=Soil SE=Sodiment SO=Solid
Relinquished By/Removed Fr 3728 2 f 24		Received By/Stor	ed In Da	ite/Time, フェー / クロ	ハ Nicke	L, Potassium, S	elenium, :	n, Cobalt, Copper, Ir Silicon, Silver, Sodiu	m, Vanad	tium, Zinc); Men	шту - 7470 - (С	(V)	SI-Sledge W = Water O-Oil
Relinquished By/Removed Fr		Received By/Stor	• 0	te/Time	(2) G			CL List) (Cesium-13 - Add-on (Americiu				1,	A-Air DS-Drum Solids DL-Drum Liquids
Relinquished By/Removed Fr		Received By/Stor		tertime f of 9	120								T=Tissac WI=Wipe ,L=Liquid
Relinquished By/Removed Fr	rom Date/Time	Received By/Ston	<del></del>	ite/Time									V=Vegetation X=Other
Relinquished By/Removed Fr	om Date/Time	Received By/Store	ed In Da	te/Time									
LABORATORY Reco	eived By	<u> </u>		Titl	e						D	ate/Time	<del> </del>
FINAL SAMPLE Disp DISPOSITION	posal Method		······································			Dispos	sed By		<del></del>	<del></del>	r	ate/Time	

Appendix 5

**Data Validation Supporting Documentation** 

## APPENDIX A RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	В	(3)	D	E
PROJECT: 100	F38 +135-P	- ک	DATA PACKAG	E: Koc	<u></u>
VALIDATOR:	イレエ	LAB: EB			19/04
			SDG:	kou r	o
Gross Alpha/Beta	Strontium-90	ANALYSES Technetium-99	PERFORMED Alpha Spectroscopy	Gamma Spectroscopy	<del></del>
Total Uranium	Radium-22	Tritium			
SAMPLES/MAT					
JIOPH	19 JIOF	to 110	FT1 7101	FTZ	
	·				
					Soil
ļ					304
1. Completenes	s			***************************************	🗆 N/A
					_
Technical verific	cation forms pre	sent?	••••••••••	Ye	3 <b>No I</b> N/A
Comments:					
				•	
	·	<del></del>			
			<del></del>		
					,
<ol><li>Initial Calibra</li></ol>	ation (Levels D,	E)		***************************************	
Instruments/dete	otora polibratodi	)			7
					Yes No N/A
Initial calibration	n acceptable?	***************************************	****************		Yes No N/A
Standards NIST	traceable?	********************		••••••	Yes No N/A
Standards Expire	ed?	•••••	•••••	•••	Yes No N/A
					Yes No N/A
Comments:					
		<del></del>			
			· ,,, , ,,,,		
			<del></del>		

3. Continuing Calibration (Levels D, E)	4	N/A
Calibration checked within required frequency?	No	N/A
Calibration check acceptable?Yes	No	N/A
Calibration check standards traceable?Yes	No	N/A
Calibration check standards expired?	No	N/A
Calculation check acceptable?	No	N/A
Comments:		
· ·	·	
4. Background Counts (Levels D, E)		N/A
Background Counts checked within required frequency?Yes	/ No	N/A
Background Counts acceptable?Yes		
Calculation check acceptable?		
Comments:	·	

5. Blanks (Levels B, C, D, E)  Method blank analyzed within required frequency?  Method blank results acceptable?  Analytes detected in method blank?  Field blank(s) analyzed?  Field blank results acceptable?  Analytes detected in field blank(s)?  Transcription/Calculation Errors? (Levels D, E)  Comments:  YOU  6. Laboratory Control Samples or Blank Spike Samples (Levels C, D, E)  LCS/BSS analyzed within required frequency?  LCS/BSS recoveries acceptable?  LCS/BSS traceable? (Levels D,E)  LCS/BSS expired? (Levels D,E)  LCS/BSS levels correct? (Levels D,E)  Transcription/Calculation Errors? (Levels D, E)  Comments:  7. Chemical Carrier Recovery (Levels C, D, E)  Chemical carrier added?		🗆 N/A
Method blank analyzed within required frequency?	Yes	No N/A
	$\sim$	
		\ _ Z
		<b>-</b>
Method blank results acceptable?  Analytes detected in method blank?  Field blank(s) analyzed?  Analytes detected in field blank(s)?  Analytes detected in field blank(s)?  Analytes detected in field blank(s)?  Cranscription/Calculation Errors? (Levels D, E)  Comments:  Analytes detected in field blank(s)?  Cranscription/Calculation Errors? (Levels D, E)  CS/BSS analyzed within required frequency?  CS/BSS traceable? (Levels D,E)  CS/BSS traceable? (Levels D,E)  CS/BSS levels correct? (Levels D,E)  CS/BSS levels correct? (Levels D,E)  Comments:  Comments:  Chemical Carrier Recovery (Levels C, D, E)  Chemical Carrier Recovery (Levels C, D, E)		$\overline{}$
6. Laboratory Control Samples or Blank Spike Samples (Levels C, D, E)		□ N/A
LCS /BSS analyzed within required frequency?	(Xe)	No N/A
LCS/BSS recoveries acceptable?	Yes	No N/A
LCS/BSS expired? (Levels D,E)	Yes	No (N/A)
	Yes	No N/A
Comments:		
7. Chemical Carrier Recovery (Levels C, D, E)	•••••	<b>P</b> N/A
Chemical carrier added?	Yes	No N/A
Chemical recovery acceptable?	Yes	No N/A
Chemical carrier traceable? (Levels D. E.)	Ves	No N/A

Chemical carrier expired? (Levels D, E)	No	N/A
Transcription/Calculation errors? (Levels D, E)		
Comments:		
	~	^
8. Tracer Recovery (Levels C, D, E)	<i> </i>	NJ/A
Tracer added?Yes	No	N/A
Tracer recovery acceptable?		
Tracer traceable? (Levels D, E)Yes		
Tracer expired? (Levels D, E)	No	N/A
Transcription/Calculation errors? (Levels D, E)		
Comments:		
9. Matrix Spikes (Levels C, D, E)	<u>Þ</u>	N/A
Matrix spike analyzed?Yes	/ No	N/A
Spike recoveries acceptable?Yes		
Spike source traceable? (Levels D, E)		
Spike source expired? Levels D, E)		
Transcription/Calculation Errors? (Levels D, E)		
Comments:	110	14/11
· · · · · · · · · · · · · · · · · · ·		

10. Duplicates (Levels C, D, E)	🗆 N/A
Duplicates Analyzed at required frequency?	Ye No N/A
RPD Values Acceptable?	_
Transcription/Calculation Errors? (Levels D, E)	l l
11. Field QC Samples (Levels C, D E)	🖸 N/A
Field duplicate sample(s) analyzed?	~~
Field duplicate RPD values acceptable?	
Field split sample(s) analyzed?	Yes (No)N/A
Field split RPD values acceptable?	
Performance audit sample(s) analyzed?	- \
Performance audit sample results acceptable?	Yes No NA
Comments: $\lambda$	o PD, FS or PAS
12. Holding Times (All levels)	
Are sample holding times acceptable?	Yes No N/A
Comments:	

13. Results and Detection Limits (All Levels)	~~	
Results reported for all required sample analyses?	Yes N	lo N/A
Results supported in raw data?(Levels D, E)	Yes N	lo(N/A)
Results Acceptable? (Levels D, E)		
Transcription/Calculation errors? (Levels D. E)	Yes N	No AVIA
MDA's meet required detection limits?	Yes N	N/A
Transcription/calculation errors? (Levels D, E)	Yes N	Vo (N/A)
Comments: 8 over		
		<u>.</u>

# Appendix 6 Additional Documentation Requested by Client

## EBERLINE SERVICES / RICHMOND SAMPLE DELIVERY GROUP KOOSO

7768-006

#### METHOD BLANK

Method Blank

	7768 Melissa C. Mannion	Client/Case no Contract		SDG_K0080
Lab sample id Dept sample id		Client sample id Material/Matrix SAF No	·	SOLID

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Potassium 40	13966-00-2	ט		0.17		Ū	GAM
Cobalt 60	10198-40-0	· U	4	0.018	0.050	ប	GAM
Cesium 137	10045-97-3	U		0.014	0.10	ប	GAM
Radium 226	13982-63-3	U		0.032	0.10	ซ	GAM
Radium 228	15262-20-1	· <b>U</b>		0.057	0.20	ט	GAM
Europium 152	14683-23-9	U		0.034	0.10	U	GAM
Europium 154	15585-10-1	U		0.041	0.10	U.	GAM
Europium 155	14391-16-3	U		0.025	0.10	บ	GAM
Thorium 228	14274-82-9	Ū		0.016		ט	GAM
Thorium 232	TH-232	U		0.057		บ	GAM
Uranium 235	15117-96-1	U		0.041		υ	GAM
Uranium 238	U-238	. <b>U</b>		1.8		ט	GAM
Americium 241	14596-10-2	U		0.015		บ	GAM

100F BurialGrnds.Remaim.Sites-SoilQT

QC-BLANK	454026				
OC-BTWINK	#34336				
	,,				

METHOD BLANKS
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SUMMARY DATA SECTION
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#### EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP KOOSO

7768-005

#### LAB CONTROL SAMPLE

Lab Control Sample

SDG 7768 Contact Melissa C. Mannion	Client/Case no Hanford SDG K0080  Contract No. 630
Lab sample id <u>R511059-05</u>	Client sample id Lab Control Sample
Dept sample id 7768-005	Material/MatrixSOLID
	SAF No RC-031

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC	3 o LMTS	PROTOCOL
Cobalt 60	0,643	0.064	0.036	0.050		GAM	0.637	0.025	101	72-128	80-120
Cesium 137	0.700	0.054	0.037	0.10		GAM	0.653	0.026	107	72-128	80-120

100F BurialGrnds.Remaim.Sites-SoilQT

QC-LCS	#54935			

LAB CONTROL SAMPLES
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lab id EBRLNE
Protocol Hanford

Version Ver 1.0

Form DVD-LCS

Version 3.06 Report date 12/01/05

#### EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP KOOSO

7768-007

#### DUPLICATE

J10FT1

SDG 7768 Contact Melissa C. Mannion		Client/Case no <u>Hanford SDG K0080</u> Contract No. 630
DUPLICATE	ORIGINAL	<del></del>
Lab sample id <u>R511059-07</u>	Lab sample id <u>R511059-03</u>	Client sample id J10FT1
Dept sample id <u>7768-007</u>	Dept sample id <u>7768-003</u>	Location/Matrix 100 F/100-F-38 SOLID
	Received <u>11/04/05</u>	Collected/Weight 11/02/05 12:45 1682 g
* solids <u>95.5</u>	% solids <u>95.5</u>	Custody/SAF No RC-031-008 RC-031

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	original pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI- FIERS	RPD	3 o Tot	DER.
Potassium 40	12.6	0.75	0.33			GAM	12.6	0.72	0.31		- 0	34	0
Cobalt 60	Ţ		0.035	0.050	U	GAM	ซ		0.037	υ .	٠.		0.1
Cesium 137	σ		0.031	0.10	Ü	GAM	Ū	•	0.030	ט	-		0
Radium 226	0.465	0.060	0.058	0.10		GAM	0.546	0.060	0.053		16	41	1.2
Radium 228	0.649	0.14	0.14	0.20	,	GAM	0.739	0.17	0.16		13	57	0.7
Europium 152	ט		0.082	0.10	U	GAM	. 0		0.082	ט	-		0
Europium 154	ū		0.11	0.10	U	GAM	U	•	0.11	ט	_		0
Europium 155	υ		0.11	0.10	Ū	GAM	U		0.10	υ	_		0.1
Thorium 228	0.798	0.067	0.065			GAM	0.576	0.036	0.035		32	36	2.7
Thorium 232	0.649	0.14	0.14			GAM	0.739	0.17	0.16		13	57	0.7
Oranium 235	Ü		0.15		υ	GAM	ט		0.15	Ū	-		0
Uranium 238	ט		4.2		ט	GAM	U		3.7	U	_		0.:
Americium 241	U		0.28		ט	GAM	U		0.27	U	_		0.

100F BurialGrnds.Remaim.Sites-SoilQT

QC-DUP#3	54937			

DUPLICATES

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